

# MOTOR AGE

Vol. XXXI  
No. 8

CHICAGO, FEBRUARY 22, 1917

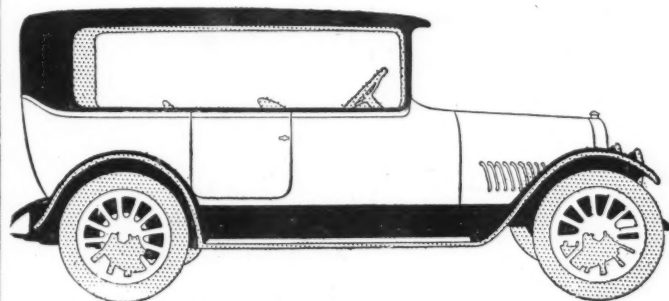
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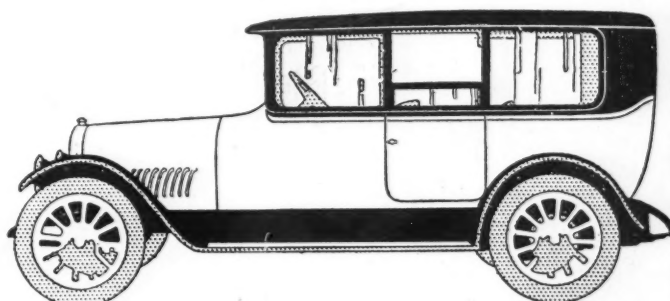
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Editorial Contents—Page 3

Advertisers' Index—Next to Last Page

*In This Issue—The Southwest, a Land of Plenty*

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# MOTOR AGE

Published Every Thursday by the  
CLASS JOURNAL COMPANY  
Mallers Building  
CHICAGO ILLINOIS

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Vol. XXXI February 22, 1917 No. 8

## Contents

POWERIZING THE FARM.....	5
Resume of Kansas City show and the tractor situation.	
THE MIDDLE SOUTHWEST—A LAND OF PLENTY .....	11
FREIGHT EMBARGO TIES UP CARS.....	17
EDITORIAL—TRACTORS ARE DEVELOPING— COMPULSORY DRIVEWAYS .....	18
WILL HELP MAKERS PREPARE.....	20
PIKE'S PEAK HIGHWAY WORKERS PROMISE GREATER ACTIVITY .....	22
THREE MILES A MINUTE AND A LOW LIFE RISK .....	28
Barney Oldfield's Car.	
CORK PROPOSED AS CLUTCH FACING.....	30
CO-OPERATION OF MAKERS URGED.....	33
LOUISVILLE AS A USER.....	36
TRADE CONDITIONS IN ST. LOUIS.....	38
ELECTRICAL EQUIPMENT OF THE MOTOR CAR .....	40
MOTOR CAR DEVELOPMENT.....	44
Acme and Pull-More trucks described and illus- trated.	

### DEPARTMENTS.

THE ACCESSORY CORNER.....	39
FROM THE WOMAN'S VIEWPOINT.....	42
READER'S CLEARING HOUSE.....	46
AMONG THE MAKERS AND DEALERS.....	50
FROM THE FOUR WINDS.....	52

### ANNOUNCEMENT

The feature of MOTOR AGE for next week will  
be "The Mayor of Junkville," concerning which you  
no doubt will fashion many conjectures meanwhile.

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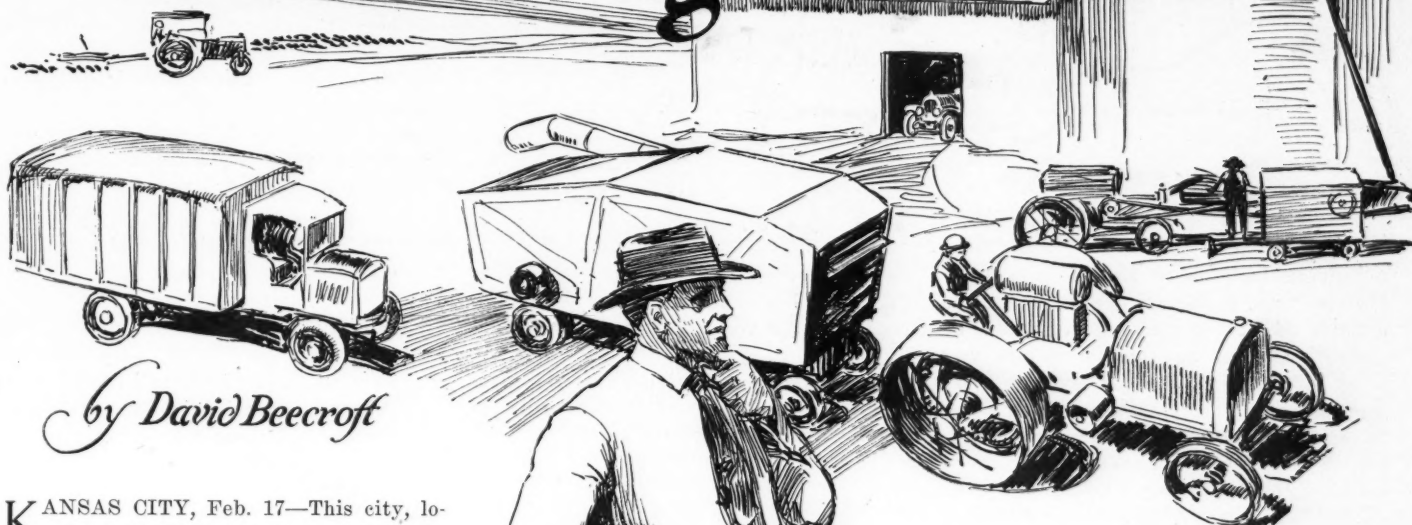
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It pays to be a *Studebaker* dealer



# MOTOR AGE

## Powerizing the Farm



*by David Beecroft*

**K**ANSAS CITY, Feb. 17—This city, located almost in the geographical center of the country, has enjoyed the distinction of being the only city in the country to stage a two-ring show circus, if the expression may be used as referring to the national farm tractor show held here as well as to the large motor car show.

Kansas City has gained the distinction of being the farm tractor center of this country. The wheat production center is northwest of the city near the northeast corner of Nebraska; the oat production center of the nation is directly north in Iowa; the corn center of production is almost directly east in Illinois; the center of cotton production is directly south in Arkansas; and finally to clinch the argument the complete farm production center of the country is located just southeast of the city in Missouri.

### Qualifies as Tractor Center

So does Kansas City qualify as the tractor center of the country and so does this fair city of the Missouri Valley qualify as the proper center for the national tractor show. Just as New York and Chicago lay claim to the two national motor car shows, so Kansas City proclaims its right to the national tractor show.

A year ago the first big tractor show was staged in a huge tent here; this year the second show is staged in the same place but under a much bigger tent and with vastly improved conditions. Kansas City owes its right as the tractor center to the activities of the Kansas City Tractor Club. This is a selling organization of a score and

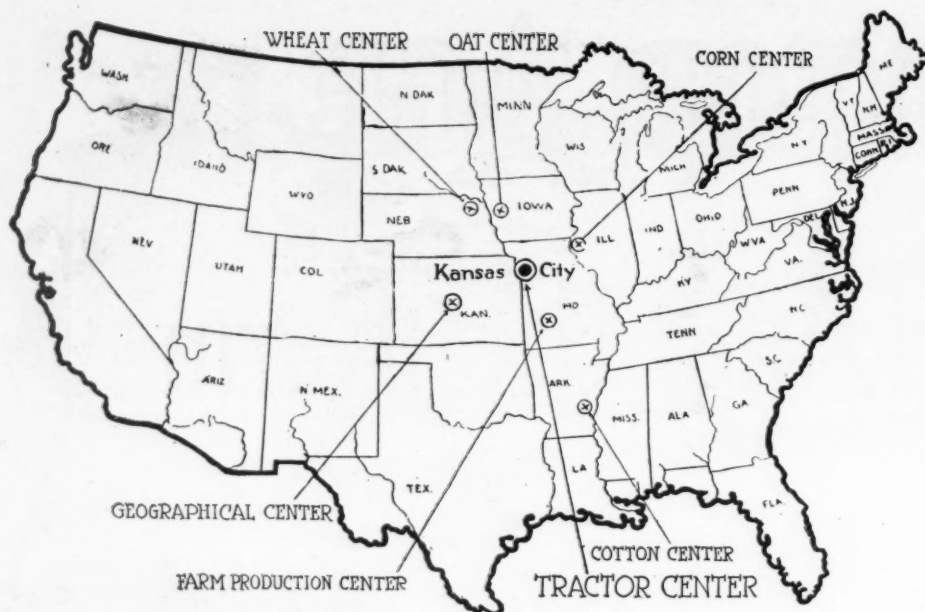
a half dealers who market tractors. More than 14 months ago they conceived the idea of getting together in a club. Two months later they put on the show of a year ago. They have grown since and are to-day the recognized tractor club of the country.

But this Kansas City tractor club has

accomplished something greater than just to stage a show. It has focused the attention of the entire country and foreign lands on the farm tractor, and this week there have been representatives from foreign lands and dealers from every state present to examine the new tractor.

### Tractor Industry Attracts Engineers

Further: The activities of the tractor club attracted the attention of the Society of Automobile Engineers, the engineering organization of the motor car industry. This organization invaded this city this week and held a huge tractor banquet Wednesday night at Hotel Baltimore with 162 tractor boosters on hand. But the engineers have gone further and have started their big work of standardizing tractor parts just as they standardized motor car and motor truck parts and are to-day standardizing aviation parts. It is this standardization of small parts that has made the enormous production of motor cars possible; it is this standardization of parts that the airplane people are looking to to make large production of airplanes possible; and in turn the tractor makers are hoping by extending this good work to make farm tractors cheaper and to be able to build them in much larger quantities and also to vastly improve their designs and get them looking more alike than they do at present. Engineers are just as essential to tractor work as to aviation, motor car or motor boat manufacture.



The map illustrates the claim of Kansas City as a tractor center

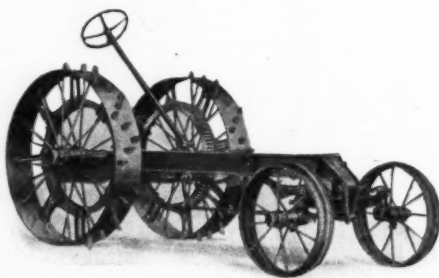
Tractors have improved astonishingly in the last year; in fact, it appears that some definite line of development can now be traced. A year ago tractor design was topsy-turvy and at sixes and sevens. There was no one definite design of which the buyer felt certain. There were one-wheelers, two-wheelers, three-wheelers, four-wheelers, five-wheelers; and tractors with one-cylinder engine, two cylinder types, with four-cylinders and with six cylinders. Then engines were mounted crosswise, lengthwise, and other conflicts of design made any definite line of development a question.

#### Design More Definite

To-day the corner has been turned, and while the show of this week has not proved the fact, it is generally conceded that tractor design has started on a more definite line. There are in the show several that might be called irregular machines built by the biggest makers, but it has been whispered generally that these big makers have in their experimental shops the new machines that correspond with the more advanced thought of tractor design. Two of the big companies, it is understood, are keeping such quiet until they are ready to bring out their new models. This situation is much the same as in the motor car industry twelve years ago, when we were

shifting from the horizontal two-cylinder engine and the horizontal single-cylinder engine to the vertical type with four cylinders.

Last year was a big year in tractordom. The makers started to build 50,000 tractors, but they did not reach the mark. The out-



Framework and running gear of new Velie tractor

put ranged somewhere between 35,000 and 45,000 machines. Nobody seems to know exactly where, but all agree that the 50,000 total was not reached. For 1917 the makers are feeling their oats and talk of 100,000 machines, but here again the conservatives claim that 70,000 will be the possible limit of the year. As in the motor car field the tractor makers have not been able to build to meet the demand for the medium-weight, or the popular machines.

Every big builder has been behind orders and still is. On the other hand those makers producing large machines to draw a dozen or a score of plows have not been able to sell all their output. The maker building a tractor to pull four plows has not been able to meet the demand.

Reverting to questions of design: The consensus is that the four-cylinder, vertical engine will dominate the field, with a few six-cylinder engines perhaps for exceptionally large jobs. At present some large production concerns are marketing the horizontal two-cylinder design, but sentiment is that they are already over the fence and prepared to bring out vertical-engined jobs. The vertical engine is placed longitudinally between the front wheels, much as in a motor truck. In fact, it makes the general layout of equipment much the same as in a truck or motor car.

#### Vertical Engine More Developed

To-day the four-wheel tractor gives evidence also of dominating the situation, but this path of development is not defined nearly so clearly as that of the vertical engine. There is more or less of an argument between the four-wheel designs and those using three wheels and having a single wheel for steering in front. Both use practically the same arrangement of vertical engine, clutch and power transmission to the two driving wheels in rear. Those using the single wheel in front argue that they can turn in less space, which is very essential in farming. The four-wheel exponents argue that there is not sufficient weight on the single front wheel for correct steering at all times, and further that the three-wheel design is not so well suited for road work as the four-wheel jobs.

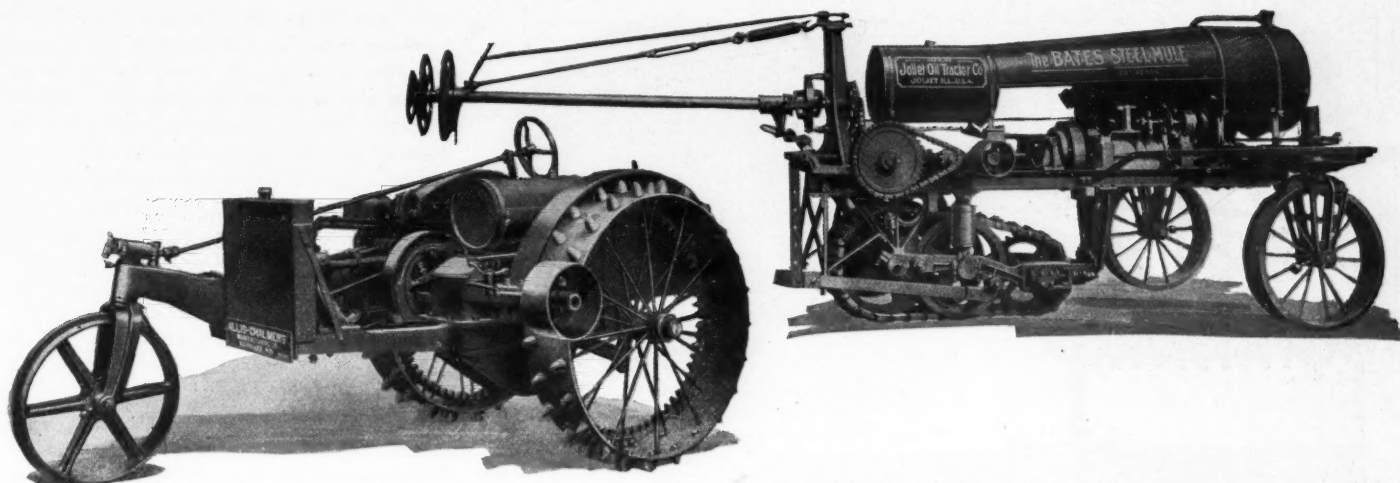
There is very general agreement that two driving wheels are needed at the rear and that those designs using only one rear driving wheel are bound to go sooner or later. The argument is advanced that they upset too easily and that there is not enough weight on the steering wheel.

It is accepted that more or less versatility of general design will enter the tractor field; in fact, this is already showing itself. Last year we suggested the necessity of special machines for corn cultivation, and this year two big concerns, Bull and Avery, have special machines for this work. They are good designs and are



In this threshing machine you see a tractor made by the J. I. Case Plow Works in operation





To the left is the Allis-Chalmers tractor. That at the right is the three-plow tractor, or the Bates steel mule

bound to be followed by others, because corn cultivation is a big enough field to warrant special designs.

It is almost amazing to see how much similarity there is in some parts of tractor design with motor cars. For example, the forward bonnet covering the radiator is on several machines as cleanly designed as on any motor truck. Some tractor engineers are just as fastidious about appearance as passenger car makers, and already they are specifying high and narrow radiators much as on some of our touring cars. The hood is well designed, and everything is as well arranged as could be asked. One tractor, the Wallis Cub, has as neat a design as could be asked for and has gone a step further than motor car makers in that the frame of the tractor and the base of the engine are one and the same piece. We have not had anything to approach this mark in car design. There is no such thing as taking the base of the engine off, as that is the frame; rather you lift the four-cylinder block off, which engine is as clean a design as could be desired. In the crankcase, if you call it that, are large holes for taking up lower connecting rod bearings.

#### Big Changes in Industry

Two of the biggest changes that came over the tractor industry last year were the more general use of kerosene and the filtering of air entering the carbureter. As a tractor operates generally in a cloud of dust it is necessary to filter the air, and various devices have been brought out. These filters are all making good and are preventing pints of dust getting into the cylinders each day.

Of just as great importance as filters has been the more general use of a fuel a little heavier than gasoline. The farmers call it kerosene, but it is generally a fifty-fifty mixture of gasoline and kerosene. It is hard sledding to sell a tractor to-day unless it will use kerosene. A year ago there was no such demand. Then gasoline was relatively cheap, but the increase in prices has quite changed the farmer's attitude. Now he demands kerosene whether he uses it or not. The tractor makers

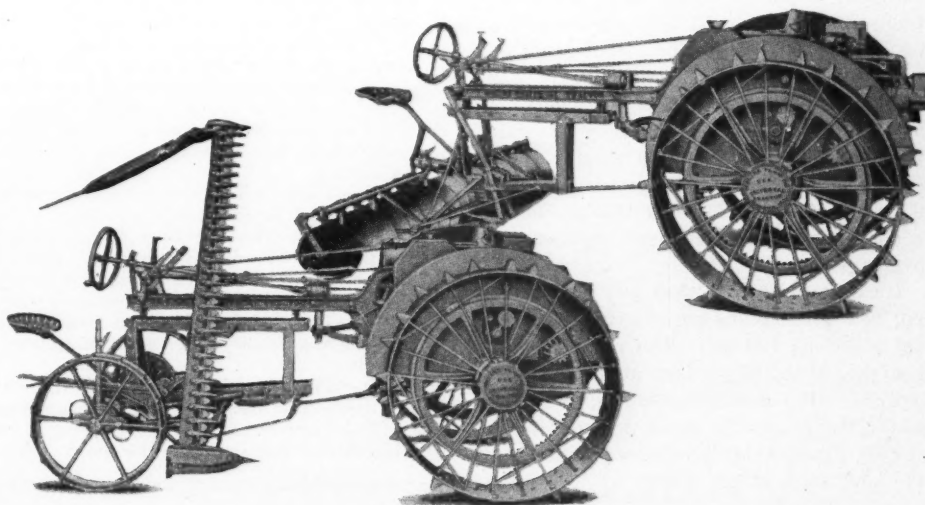
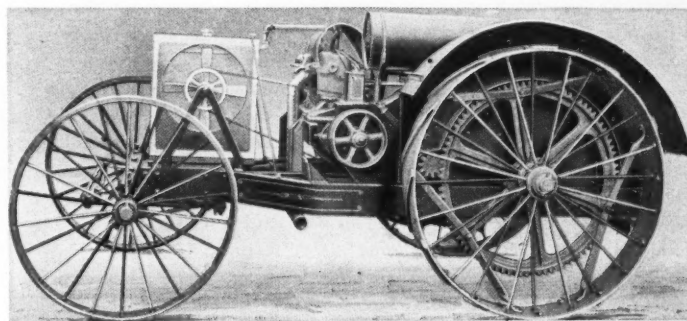
and the carbureter makers have risen to the occasion and provided devices that will handle kerosene, but even this is no assurance that such is being used. The opinion is very general that very few farmers are using pure kerosene, but that most of them are mixing it with gasoline.

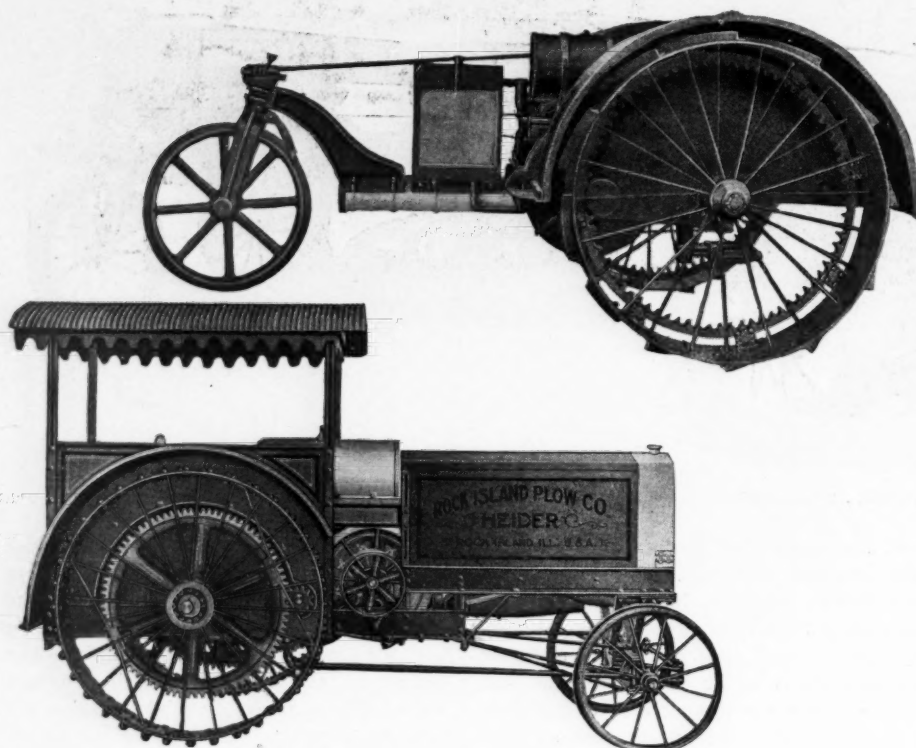
Engineers generally agree that at present you cannot get the same efficiency out of kerosene that you can out of gasoline, even with your so-called kerosene carbureters. The horsepower output of engines is lower with the kerosene, and while farmers may say they are using kerosene very satisfactorily, that is due to the excess of power they have, which leaves them plenty of power even with the lower efficiency of kerosene.

Some tractor makers handle kerosene by

using gasoline for starting and then switching onto kerosene. They have in several cases waterjacketed the intake manifold to prevent condensation. Others heat the entering air to have it pick up the kerosene. Others use heat in different ways. The engineer invariably shakes his head when you talk of heating the air or using other heat. To him that means lower efficiency and less horsepower. It is this way: When you heat the air you increase its volume and consequently get fewer molecules of air in the cylinder for the explosion. This means less horsepower in spite of kerosene. A parallel is your experience on the top of a mountain. There the air is rare or thinner, just as heated air is thinner. You have no energy to do much work on the mountain top. There

Right — Huber light four tractor. Below are two Moline-Universals with working attachments





Above—Gile model L Below—Heider model C,

is not enough air getting into your lungs. In a modified way this applies to the use of heated air in burning kerosene in the tractor.

There are other arguments against the use of kerosene in farm tractors. It is a hard problem to prevent the engine gumming up, and further, the kerosene works past the piston rings and gets into the crankcase, where on mixing with the oil it destroys its value and demands frequent changes of it. Others claim that the kerosene cuts the useful oil off the piston rings and that much more frequent replacement of rings is necessary. Tramp around the show and talk with practically every engineer and you get loaded up with a score of experiences with kerosene, and in the end 90 per cent of the engineers do not believe pure kerosene is being used, but rather the fifty-fifty mixture.

#### Fuel Problem a Real One

This fuel problem is a real one with farmers, many of whom have an innate feeling that they will not pay more than 20 cents a gallon for fuel. This cuts out gasoline in several places. It may soon cut it out in others. The engineers are more or less concerned, but they generally feel they are getting the matter under control. They acknowledge tractors need better engines than motor trucks, just as trucks require more efficient engines than passenger cars.

Here is about how they put it: Reducing the problem to percentages it works out about as follows: The motor car engine uses about 15 per cent of its maximum power on the average; the engine of the motor truck uses 25 to 40 per cent of its power; whereas the farm tractor uses about 100 per cent of its power all the time.

This calls for a high efficiency in tractor engines. It sets a new high mark in engineering and engineers of those concerns providing engines have been working overtime to get all the bad spots out of their products, which have been the last word of satisfaction in car and truck use but which have not been up to par for tractor work.

Engine makers have met many obstructions in refining their engines for tractor work using kerosene. They have found much pre-ignition, which has resulted in a complete redesigning of the combustion chamber to rid it of all hot spots which might lead to pre-ignition. This has been no small job; in short, has been a real engineer's task. Spark plugs have given trouble, but it has been remedied by better

waterjacketing. The trouble of kerosene working into the lubricant in the crankcase has been largely overcome by better piston and ring fitting. The net result is that the tractor has had a very great influence on the motor car and the motor truck, and thanks to the tractor we are getting better car and truck engines. Here we have a good example of how a new industry results in turning over stones that have laid too long on their one side in older industries.

#### Improvements in Farm Tractors

There are many other ways in which farm tractors are being improved. The gearsets are vastly superior to a year ago, and now the rule is to inclose every part of a tractor as well and better than on a motor car. Owing to the cloud of dust in which the tractor works dust is everywhere and gets everywhere. Bearings have to be better protected, and we are glad to note that makers are using a more positive method of keeping dust out than their argument of a year ago that they put plenty of grease in so that as it leaks out it prevents the dust from getting in.

More tractor makers are using cut gears than formerly. By cut gears are meant gears cut out of the solid block by gear cutting machines. Cut gears are used in motor cars and trucks. Formerly many tractor makers used cast gears. They are changing their engineering in this respect. Not only are the gears much stronger, but they are reducing them and inclosing them better.

#### Tractors Harder on Magnetos

Tractors are much harder on magnetos than either motor cars or trucks are, and while the magneto on a car may require but a few drops of oil every 3 months, it is necessary to oil it each week and oftener on a tractor. Magneto makers have learned several lessons regarding the much harder service their instruments are subjected to in tractors than in trucks or motor cars. The same applies to many other

#### TRACTOR DESIGN DIAGRAMS

See opposite page

1—Four-wheel tractor design with two large driving wheels in rear and two smaller steering wheels in front. The front wheels vary in diameter and also in tread. They are placed generally farther apart than shown.

2—Four-wheel tractor design in which two front wheels are so small in diameter as to really serve as a single wheel.

3—Three-wheel tractor design with two large driving wheels and one steering wheel located at one side and in front. The diagram shows a two-cylinder engine.

4—Three-wheel tractor design with a single steering wheel and one very large rear wheel for driving. There is a second rear wheel made quite small for balancing.

5—Three-wheel tractor design using two large driving wheels and one very small wheel in front for steering.

6—Four-wheel tractor design with large driving wheels in rear and relatively small front wheels for steering. Note the cross method of engine mounting.

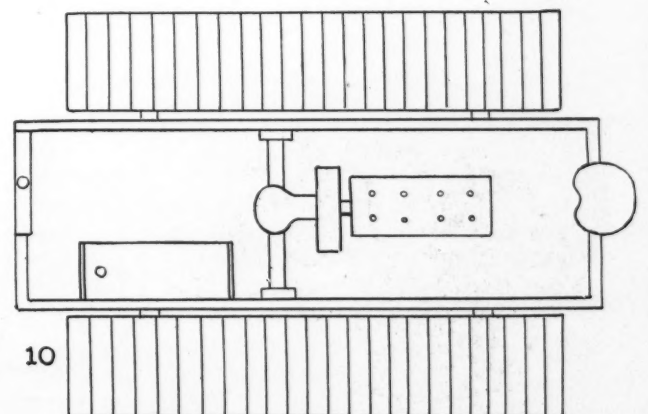
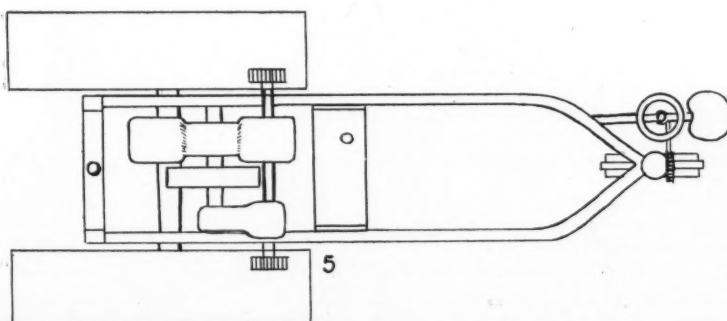
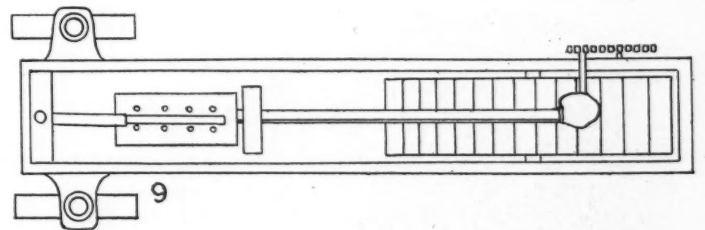
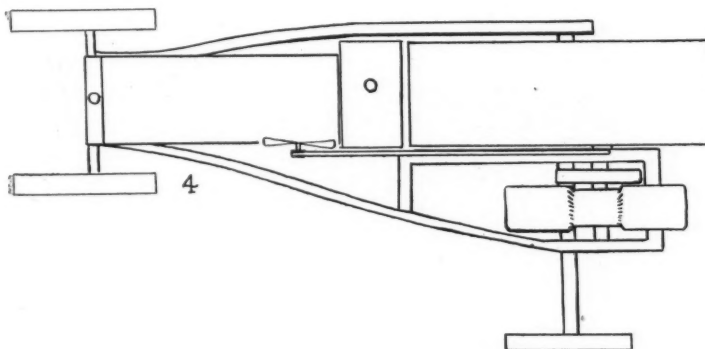
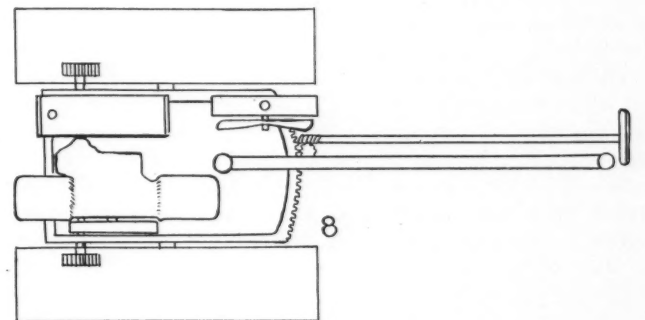
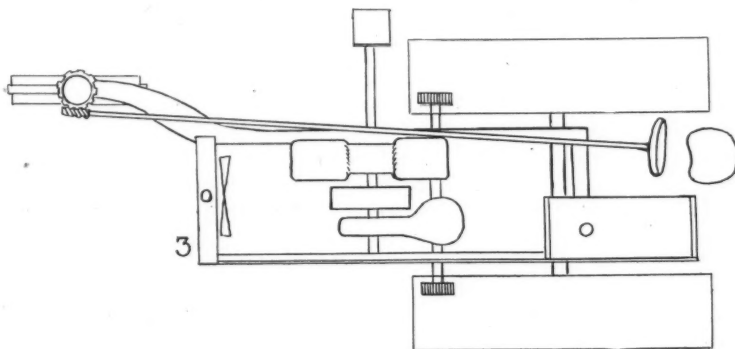
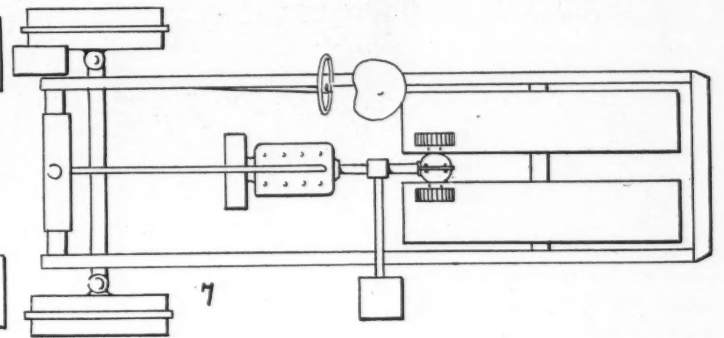
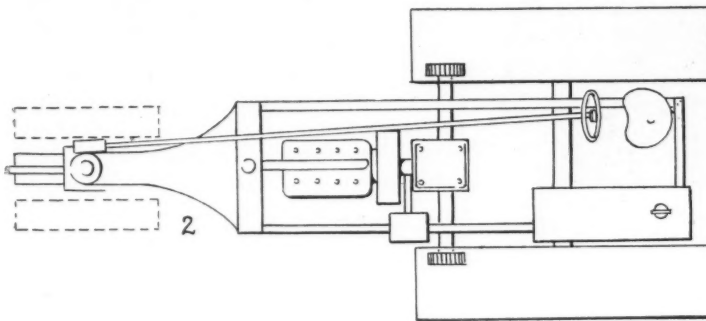
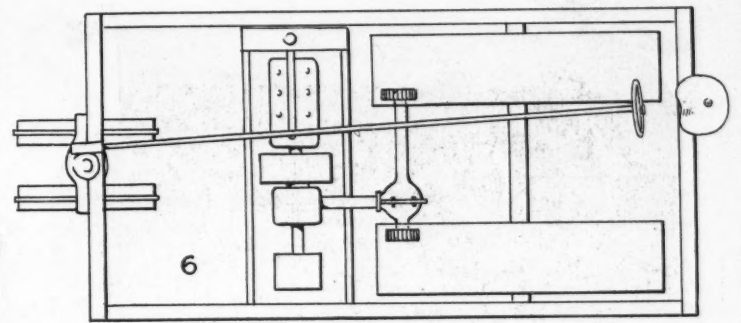
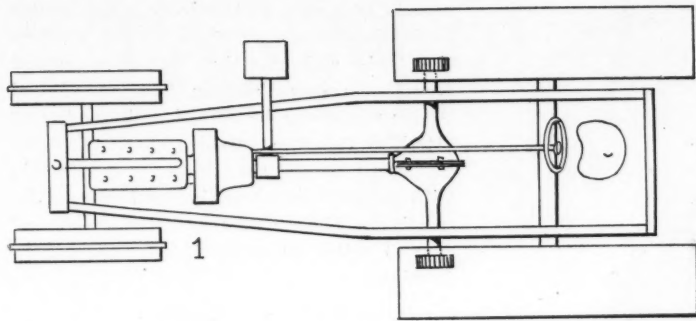
7—Unusual tractor design, with two large steering wheels mounted very far apart and with two driving wheels placed very close together at the rear.

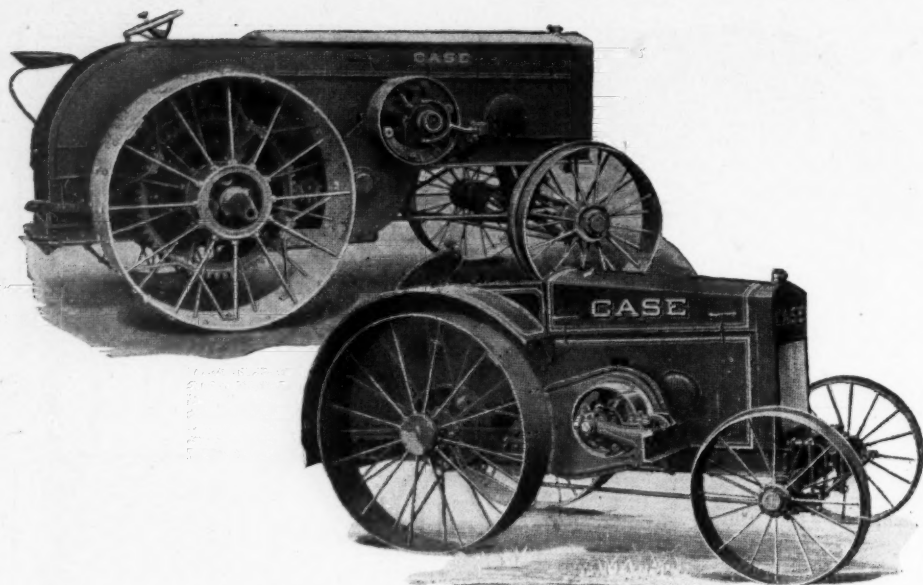
8—The tractor tractor, a two-wheel design to which you can couple any piece of farm machinery. The entire power plant is mounted between the two driving wheels.

9—The combination wheel and caterpillar tractor, with a single caterpillar for driving in the rear and two steering wheels in front.

10—The short caterpillar using a caterpillar, or flat wheel, idea at each side. This design has been on the market for some time.







These Case tractors are those of the J. I. Case T. M. Co.

parts of the tractor, which while working nearly all of the time in dust are always drawing a full load, a markedly different condition from cars. There is no down hill coasting with tractors.

There are many unsettled points in tractor development, and one of the major ones is tractor rating. In the early days of motor car design we adopted what was known as a horsepower rating equation, which has been generally used ever since but which has not proved very satisfactory and can scarcely have been called a complete success. In the tractor field they have what is known as a rating which includes draw bar and belt power, each tractor having a large pulley for belt drive, as often 50 per cent of a tractor's work is driving machinery by its belt. At pres-

ent these ratings are too variable and already the makers have set to work to settle on some standard system so that all will talk sooner or later in the same terms on this subject.

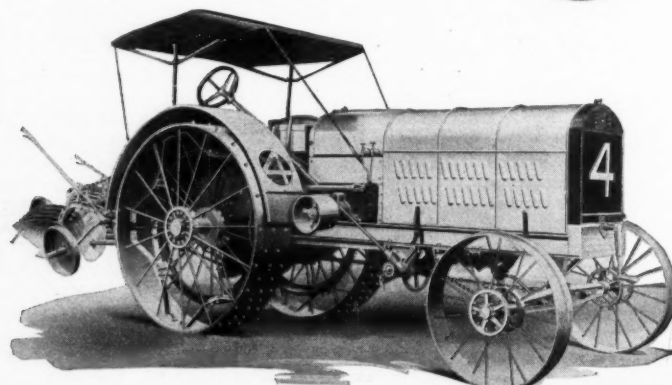
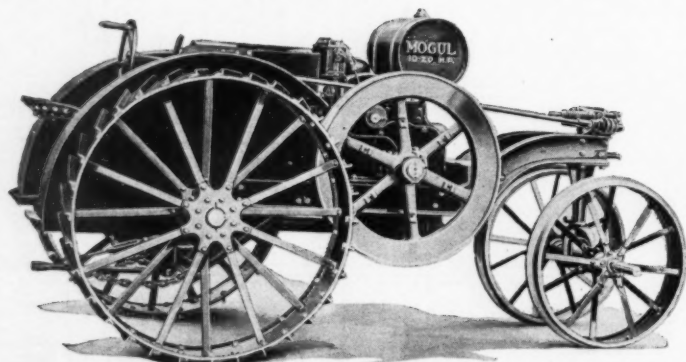
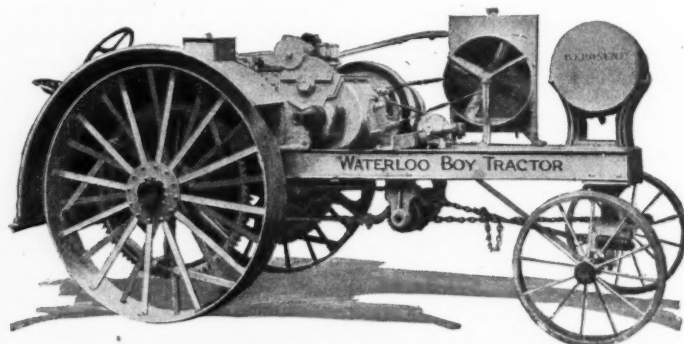
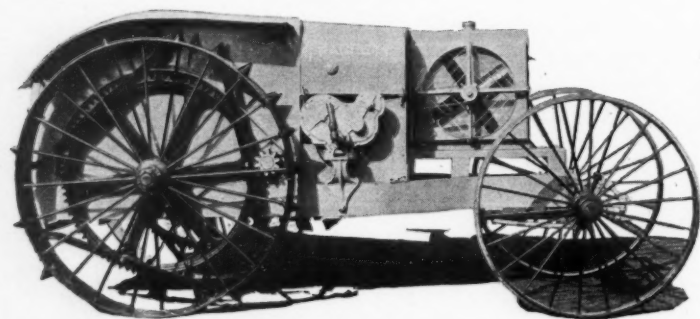
As to the eventual type of tractor little can be said, excepting the general statement that many think the eventual tractor will have to combine work on the farm with work on the road a little better than it does to-day. The tractors are designed generally to plow, harrow, draw binders, mowing machines, seed drills, harrows and other tools for soil cultivation. But the farmer must transport his grains to the depot, and must do many other road jobs. One tractor maker with this in mind has designed a machine with five wheels. He has two steering wheels in front and three

wheels in a row at the back. The center back wheel is a very wide one for work in the fields, and at either side is a narrow wheel. In less than an hour the broad center wheel can be moved and wood tires fitted to the two outside wheels, thereby giving a very good machine for road work, with speeds claimed as high as 5 or 6 m.p.h., relatively high compared with speeds of 2 or 3 miles as they may be needed in plowing.

#### Combined Machine in Doubt

Nobody feels very certain on this question of a combined machine for soil cultivation and road work. The farmer has bought his motor car, which often costs him as much as a tractor, and it is assumed that he will soon buy a motor truck, which should care for all transportation work. This would leave the question of tractor design solely up to that for soil cultivation with the necessary belt drive for running farm machines. With such an avalanche of converting devices for making Fords, Overlands, Buicks, Studebakers and Dodges into light trucks, it will not be surprising to see these in very general use, and doing their part to powerize the farm.

One tractor maker has developed a two-wheel design which occupies a similar position to that of the tractor used in the truck field. It is a very short four-wheel machine designed to have the front end of the trailer carried on it. In the farm tractor field this maker has a two-wheel machine incorporating the engine, transmission and everything that goes with it. This two-wheeler can be hitched in front of a mowing machines, a binder, a set of plows or any other farm implement. It is suggestive of the versatility of thought in tractor development.



Upper right—Waterloo Boy tractor; upper left—Parrett;

lower right—Emerson-Brantingham big four; lower left—Mogul



# The Middle Southwest A Land of Plenty

by W.B. Blood and B.S. Brown

**P**URCHASING of motor cars in the territory surrounding Kansas City, including all of Kansas, Oklahoma and Missouri, is a matter of factory output rather than a fixed expenditure. Of over 100 dealers interviewed from all parts of this great country there were three exceptions to the rule that they would sell every car the factory would ship them. A conservative estimate of the motor cars distributed in Kansas City territory in 1916 is \$50,000,000 worth, and summing up the dealer's, branch house and distributor's demands the business for 1917 will be over five times as great, or approximately \$80,000,000 worth.

This is conservative. It is what the dealers expect to sell—not what they could sell. The output of the factories is not enough to supply the southwest. And this vast growth of the industry breaks through the hard dirt of a rather poor crop prospect, increased cost of cars and increased cost of living.

## Reasons for Prosperity

On the strength of this statement one would naturally say, why the prosperity? Why this great spending in the face of what might appear to be a poor season? In the first place, the agricultural element of this section broke all records in 1916. It is well to suppose that the fortunes made in that great year are not all spent. Optimism is the rule in the Southwest and the farmers are spending 1916-made wealth with their eyes open to a year of intensified, scientific, mechanically-handled farming for 1917. Furthermore high prices will well nigh compensate the shortage.

Then, too, there figures into the new wealth and prospective wealth created and to be created the startling discoveries of vast quantities of oil under Kansas. The state is being drilled from one end to the other and in some neighborhoods there is already a production which is making land owners rich—and richer because of the high cost of crude.

Kansas City territory is primarily a grain and stock raising territory. Yet many farmers are making more spending money out of the oil under their fields than out of the crops on top. So rapidly has the spread been in the known fields of production that geologists have had to revise their estimates on the possibilities

of the district. In many sections every farmer is looking for a lessor of oil rights. Wichita is well on its way to rival Tulsa, Okla., as an important oil center, both for trading stock and for supplying crude to the refiners and supplies to the oil operators.

The oil boom is now to the oil business what California and later Klondike was to the gold business. The boom is the talk of the territory—and it is not all talk. Perhaps every third person is an investor in oil stocks. However, as a sign of good business, this stock sale does not mean the withdrawal of money from circulation. Most of the money, we might safely say 90 per cent of it, goes right into development, the drilling of wells, the transportation of supplies, the moving of oil, the moving of the men who handle the business and as an important factor the use of oil for industrial purposes.

The comparatively insignificant amount of land turned over to oil production is of course more than compensated in the revenue for leases, or from oil. The new El Dorado and the Augusta fields of Kansas are the most recently active, with new developments in Oklahoma also.

The United States Geographical Survey gives the following figures for Kansas oil production: 1909, 1,263,764; 1910, 1,128,668; 1911, 1,278,819; 1912, 1,592,796; 1913,

2,375,029; 1914, 3,103,585; 1915, 2,823,487. This is a total of 28,074,074 barrels. The estimated future production of 40,000,000 barrels has been entirely abandoned, due to the recent discoveries of vast new fields.

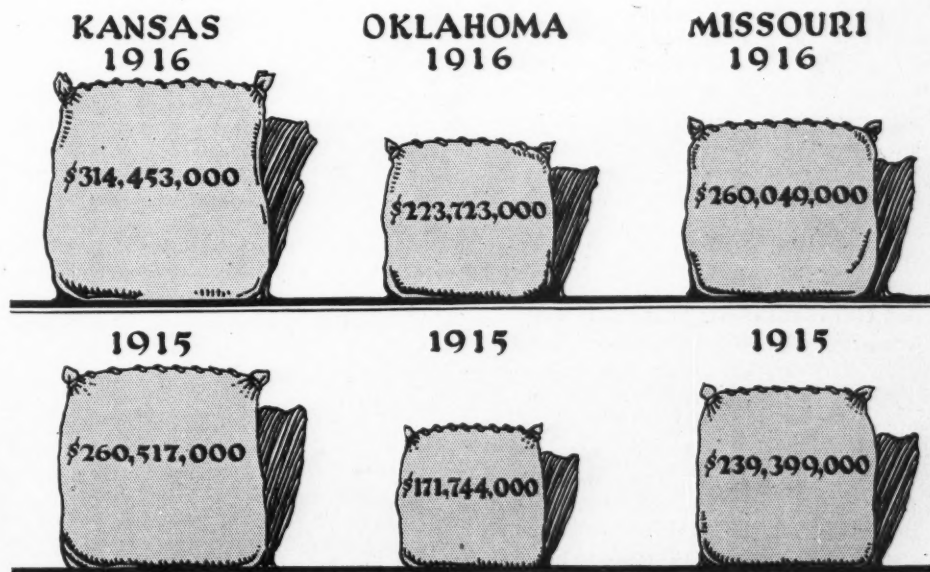
There are practical and tangible means of estimating the spending power of the people of Kansas, Oklahoma and western Missouri, which constitute the chief territory supplied by Kansas City.

## Agriculture Is Basis

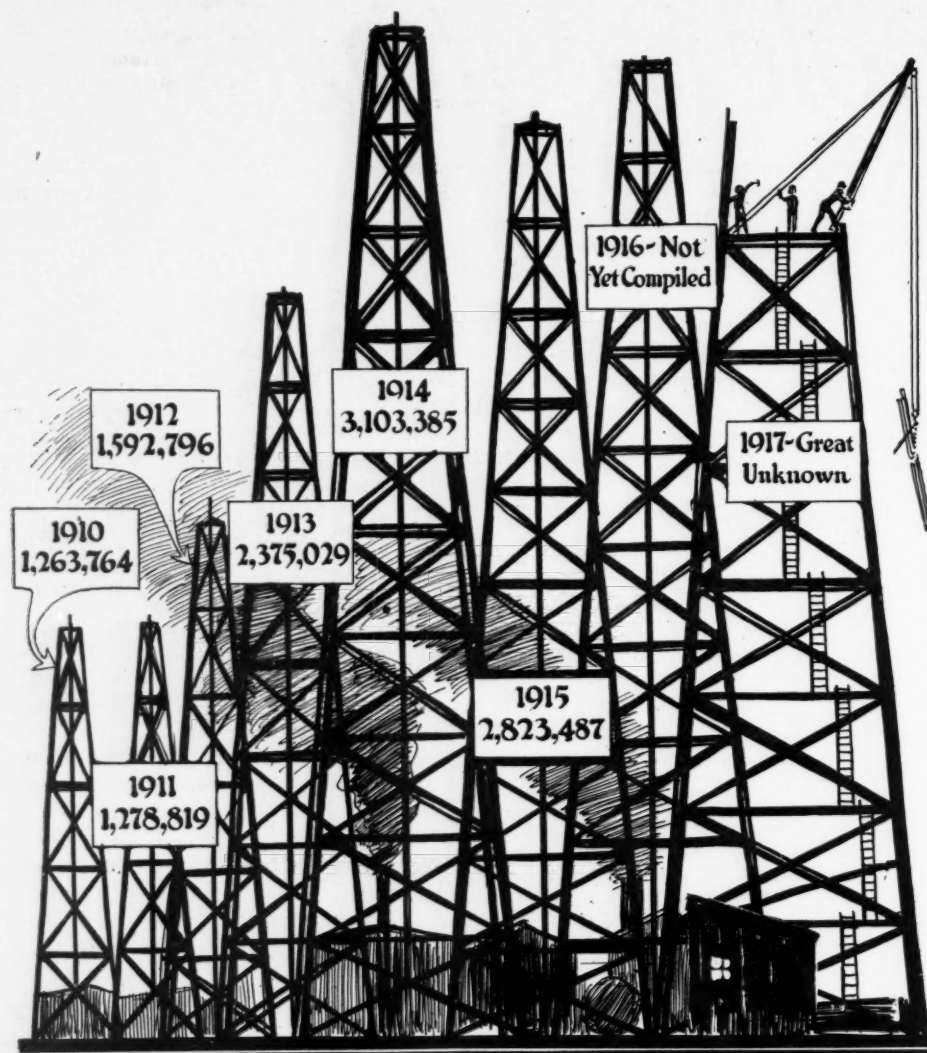
The basis of the wealth of this district is of course agriculture. Furthermore there is a great acreage suitable for farming still undeveloped. In districts where rainfall is slight and winds are high and frequent it is now being realized that mechanical tilling of the soil by use of tractors will permit of exceedingly profitable crops. Therefore this agricultural country will not only depend on intensified farming of fields already cultivated but will fall back on entirely new fields to increase its production. The values of the 1916 and 1915 crops in the three states were as follows:

	1916	1915
Kansas .....	\$314,453,000	\$260,517,000
Oklahoma .....	223,723,000	171,774,000
Missouri .....	260,049,000	239,399,000

Think of it! Kansas values increased over \$53,000,000, Oklahoma over \$51,000,000 and Missouri over \$20,000,000. No wonder



Think of it! Kansas crop values for 1916 increased over \$53,000,000, Oklahoma over \$51,000,000 and Missouri over \$20,000,000. No wonder the farmers are buying cars



*Kansas oil production has increased in the last 7 years, but in no measure does this steady previous increase prophesy what is to come. There is no present means of estimating the vast untouched Kansas oil wealth*

the farmers are buying cars. No wonder communities of 12,000 people are buying over thirty of one make of car which sells above \$3,000.

Making it as bad as possible, let it be mentioned that Missouri's gain was largely increased by unprecedented high prices. Missouri has not the possibilities of development of the other two states. Its acreage and possibility of production is more fixed. However, the eastern part of the state has had bad corn seasons for two years. High prices and agricultural prosperity have compensated, yes, more than compensated for it.

But there is Kansas. This state has an increased acreage of 2.8 per cent in winter wheat this year, or 8,887,000 acres. The winter has not been good for winter wheat. There has been a shortage of moisture, and winds blew over the soils for unusual periods. Moreover the farmers were unable to plow when they should, due to extreme hot weather. A great majority of the farms are still horse equipped. When plowing should have been done, the horses were in the barns panting with the heat. Here is the field for the power tractor. It is said

that millions could have been saved had tractors been used last summer.

Corn and hay must be considered in connection with live stock and in live stock the Kansas City territory has a year that will go down in history—unless 1917 beats it. Receipts of cattle last year were 2,177,468 head against 1,860,235 in 1915, with the highest prices ever seen for all classes from prime fed to stockers. More than that, January, 1917, prices exceed the levels of the same month of a year ago.

Comparison of prices the first week of February with the same week in 1916 shows about 30 per cent increase all down the line. While commission men had feared a slump in the receipts of the first six

months of 1917, the arrivals are holding up—and every beef animal sells from \$15 to \$35 more than a year ago.

Last year was a record year in sheep, too, as to total money paid, although the receipts were lower. It is said that the West—largely outside Kansas City territory and therefore not affecting the present subject—was drained of sheep.

Receipts of hogs were nearly half a million larger than in 1915, with 2,978,933; and prices rising nearly \$4 per hundred during the year. Prices of hogs on the Kansas City market in February reached nearly \$12.50, against \$8.30 a year ago, or \$9 to \$12 apiece more for the hogs coming now.

The government reports a loss of one-half of 1 per cent in the hog crop this year. The government figures on the hog population of Kansas, Oklahoma and Missouri are:

	Jan. 1, 1917	Jan. 1, 1916
Kansas	2,535,000	2,815,000
Oklahoma	1,372,000	1,491,000
Missouri	4,280,000	4,505,000

The average value per head in 1915 was \$8.40 and in 1917, \$11.73.

The farmer, facing higher prices for his crops and higher costs for feed, will be hard put to decide whether to take profits on one thing or another. With the army organizing and buying harness and shoes, hides will be an important factor in increasing the value of stock. The army also will need hay and grains as well as food-stuffs for the men, which will make prices still higher.

#### Eighty Million Lowest Estimate

We said that the sales in cars in this territory will be around \$80,000,000. This is really about the lowest figure one hears. Most dealers in motor cars and accessories, branch managers and traveling agents, most business men of the district, even the bankers, seem inclined to raise the ante. The estimate for the sale of cars will be at least 50 per cent greater than last year and may go as high as 100 per cent. That is up to the makers of the cars.

The most optimistic people in Kansas City are the bankers. Even the Federal Reserve Board sees only brightness for this territory in almost every line of industry from corn to hogs. If some fail there will be others left.

The dealers in small and large towns throughout the territory are without exception of a most optimistic turn of mind. They all did a big business last year. They all intend to do a much bigger one this



*Motor car buying in Kansas City territory in 1916 approximated \$50,000,000. The conservative estimates for the 1917 season place the figure at \$80,000,000*



year. Let us tell you what a few of these men had to say to us.

There is a man named A. J. Oliphant from Hutchinson, Kan. He sells the Oakland and Marion-Handley cars in Stafford county. In a territory embodying 22,000 people, most of whom are directly or indirectly dependent on agriculture for a livelihood, he sold 123 cars in eleven months and ten days, and 90 per cent of these sales were for cash.

Right here develops another surprisingly interesting phase in the car sales of this territory. People are buying their cars for cash. In the East the farmer's purchases are regulated by his crops, and farm credit is an expected thing and a big institution. Farm implement salesmen came into this new territory with the same ideas and, of course, the farmers were willing to buy their implements on credit. Now the implement people are gradually footing their business on a cash basis.

The broad minded dealers see the phase that implements are a necessity. Farmers are paying cash for them and can well afford it. Motor cars are a luxury from an economic standpoint, and if they are paying cash for necessities then it is only reasonable that they should for luxuries. This law is, of course, a variable one. It depends entirely on the prosperity of the section and education the people have received in handling their money. However, most of the territory is swimming in prosperity and money is hard to dispose of, except on farm mortgages.

#### Winter Cars in Demand

T. P. Oliver is connected with the J. R. Johnson Motor Co. of Topeka, Kan. His company sold seventy-five cars last year and would have sold 100 more if the factory could have supplied them. What cars he did get came in flats, gondolas, 5-ft. door box cars in all conditions of assembly and disassembly, because of lack of suitable railroad equipment.

Oliver speaks of a demand for winter cars. The winter car is slowly coming into its own in the Southwest. In some sections buyers are asking for them; in others a few are being sold by salesmen going after the business. All dealers, even in small towns, are impressed with the idea that the convertible cars and removable top cars are going to be big sales factors within another year.

The four-passenger roadster is already approved and is enjoying a big sale, even to the farmer who uses it for a family car. The general opinion is, however, that the four-passenger bodies, as a rule, are cramped for room. In this line there is a strong sentiment for touring cars which are really touring cars. These parts have roads of dust and roads of mud. Baggage carried in truck racks on the rear and on the running boards stands little chance of keeping fit under such touring conditions. The Southwesterners want touring cars with inclosed space for two or three suit-

cases. They all want them. It is not the notion of a few.

J. O. Parker sells Chevrolets in Scott City, Kan. He has four counties, Scott, Lane, Wichita and Greeley with a population of 12,000 to 15,000 people. This progressive dealer sold thirty-five cars in 1916 and his new contract calls for forty-seven cars, half of which are already sold. The rest of his season will be spent in a fight for all the cars he can get above his contract. The factory could not give him enough cars and he wants more, and a lot of them. Parker's neighbors are farmers and stock raisers. He is giving some of them time, but he has never lost a cent in carrying paper.

Furthermore the motor car is not his only business. He is selling implements and making good there, too.

#### Short Delivery Limits Sales

C. R. Young sells Buicks and Fords in Plattsburgh, Kan. His territory brings in an approximate population of 12,000 people. A total of fourteen Buicks and thirty-eight Fords left his shop in 1916 and the only reason he did not sell more was because the factories could not get them to him. From the first of August to date he has sold thirty-nine new Fords. Winter business in his neighborhood has far surpassed all records. This, he claims, is due not only to prosperity but to the remarkably open winter, with smooth, dry roads almost daily. As an example of this, Young bought \$3,000 worth of Ford-size tires which he had estimated would last him until July. He sold the last of this stock this week. In Young's territory closed cars are slow. Yet what few are there are the talk of the county. He expects a big business in this line in another year or two. Young conducts an all-cash business. His neighbors are cattle and hog feeders and it is a neighborhood of universal wealth.

M. H. Randall of Oklahoma City handles the Velie and the Chevrolet. His Velie territory covers the state and the Chevrolet territory five counties. In 1916 200 Velies and 300 Chevrolets were disposed of, with the amount of time sales practically negligible. For 1917 he assures the factories that he will sell all the cars they will send him.

Getting into the distributing center of

all this great territory, Kansas City, we find the dealers universally in a most optimistic frame of mind regarding car sales but in quite the opposite frame of mind with reference to their ability to procure cars. The condition of the transportation rolling stock is most discouraging. So great is the lack of shipping facilities that several dealers have announced their intentions of driving cars here from the Detroit factories. Great numbers of cars will be distributed from Kansas City by the driving method, and many of these will go to the far corners of the territories.

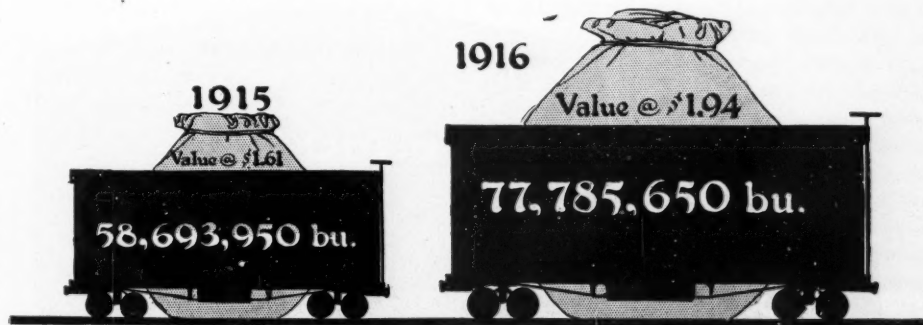
Manager A. P. Tenbrook of the Oakland factory branch is trying to meet the situation with an agreement with his dealers whereby they will accept any number of cars at any time and in any condition of assembly. He has already received the signature of a majority of his dealers to this agreement.

The Oakland allotment of cars to the Kansas City branch is 25 per cent greater than last year, and to date it has received less cars than in the same period last year. Tenbrook blames this to railroad equipment and not to factory output. He spoke of the big business increase in the El Dorado and Augusta oil field district. This territory was previous to this year considered a poor sales center.

#### Winton Territory About Largest

The Winton factory branch has about the largest territory of any branch in this city—Kansas, Nebraska, Missouri, Tennessee, Kentucky, Arizona, New Mexico, Oklahoma, Texas, Louisiana and Mississippi. George Arbuckle, manager, says the southern territory has shown big gains since the advance in the price of cotton. The oil, lead and zinc developments in the several states of this territory have caused a very noticeable increase in orders. Mr. Arbuckle believes that the war scare will make the future motor car business a bit conservative despite the prosperity of the past season.

The large majority of dealers in Kansas City are distributors for Kansas and Missouri in addition to their retail output. Kansas City, like Chicago, has witnessed a very large expansion along building and remodeling lines on motor row. This growth is without doubt the result of the



On the Kansas City market wheat receipts were 77,785,650 bu. in 1916 against 58,693,950 bu. in the year previous. The 1916 price was \$1.94 against the top price of \$1.61 in 1915. That is a receipt increase of 19,091,700 bu. and a price jump of 33 cents

enormous increase in business and based on perspective gains.

The Hudson branch has 102 counties in Kansas and Missouri. There was a 100 per cent increase in volume of business of last year over the 1915 fiscal year. The allotment for the coming year is 800 cars. The seventy-five dealers in the territory are behind at the present time on their deliveries. The Hudson-Brace Motor Car Co. of Kansas City, Hudson distributor and dealer, is now occupying a fine remodeled salesroom and service station. W. J. Brace, the manager, speaking of the winter's business, says, "We have sold more closed cars this winter than any other style. Of course the demand at this time of year is normally for this type, but the case this year is far above anything we have experienced hitherto." The unusual demand for convertible sedan bodies comes from the excellent driving winter this section has had. The absence of bad weather and snow has increased all motor car activities and facilitated the early delivery of hundreds of winter orders that would not have been turned until March or April.

#### Prospects Give Enthusiasm

R. P. Rice, manager of the Kansas City branch, speaking of the prospect for next year's distribution of Fords in the eighty-three counties of Kansas and Missouri, was very enthusiastic. As every one knows the big problem in the Ford branch distribution is to get the cars out and enough freight cars to convey them to the respective dealers. The local branch opened here in 1910. Since that time they have been doing a capacity business. The increase in cars distributed in this branch's territory in 1916 over the previous year is 100 per cent. The Wichita territory was taken away from them last August because the plant was unable to take care of the demand.

However, this branch takes care of the assembling end of the St. Joseph and Oklahoma branches since the traffic situation has made it a matter of economy to assemble cars in Kansas City. Of the fifty counties in eastern and northern Kansas and the thirty-three of western Missouri controlled by this point there are 276 dealers. In some cases there are four

retail dealers to the county. There are two counties in the northern part of Arkansas under this branch. From the first of August this season till the first of February the branch turned 10,313 cars. When it is understood that the plant assembles 150 to 160 cars a day right here in Kansas City it is easier to comprehend the volume of business possible. The allotment, assembled only, for the Wichita and Omaha branches for 1917 is 41,652 Fords. The allotment for sales in this territory for the coming season is 19,880.

#### 800 Per Cent Increase

The Butler Motor Car Co., handling Dodge Bros. motor cars, does nothing but the retail sales, and every other dealer in the country is a direct factory branch or territorial agent. The Kansas City agency estimates that the sales made thus far in the season have shown an 800 per cent increase over the showing made during the same period last year. The Dodge people expect an allotment of at least 700 cars this season, which is 200 cars better than they sold last year. In the six or seven counties adjacent to Kansas City there is a pronounced demand for used Dodge cars. The branch here has experienced great difficulty in getting enough cars to supply the demand, and that condition does not seem to be any better now than last year.

W. H. Himes, Dodge distributor at Topeka, Kan., speaking of the Shawnee county prospects for the coming year, said: "We depend very largely on the corn crop in these parts for the volume of motor car business in this county. The oil belt is showing a steady increase in sales, which is of course the natural thing to be expected. The wheat is not in very good condition at present, but we expect to do a very large business the coming season." Himes has placed orders for forty Dodge Bros. motor cars since the first of the year.

The White factory branch is now announcing the new sixteen-valve four and reports that a great interest is shown in the new model. It has placed more orders for this car thus far this year than on any other White car during a like period.

The Hiatt-Buick Co., devoted to the retail sales in Jackson county, made an in-

crease in 1916 of 60 per cent over the 1915 business. Its allotment for 1917—in this county only—is 400 cars. This January the sales record lacked but one car of being an even 400 per cent increase over January a year ago. The salesmen work on a salary basis only with an advance when the returns indicate. The Topeka Buick company, which turns a favorable number in comparison with this branch showing, gives its salesmen a commission on every car sold in the house. This stimulates a harmony between the salesmen that seems to get good results. The scheme was inaugurated by Mr. Woods, who is always alert to secure the utmost cooperation between his men. The Hiatt-Buick is erecting a new, absolutely modern salesroom and service station at the northwest corner of Seventeenth and McGee streets.

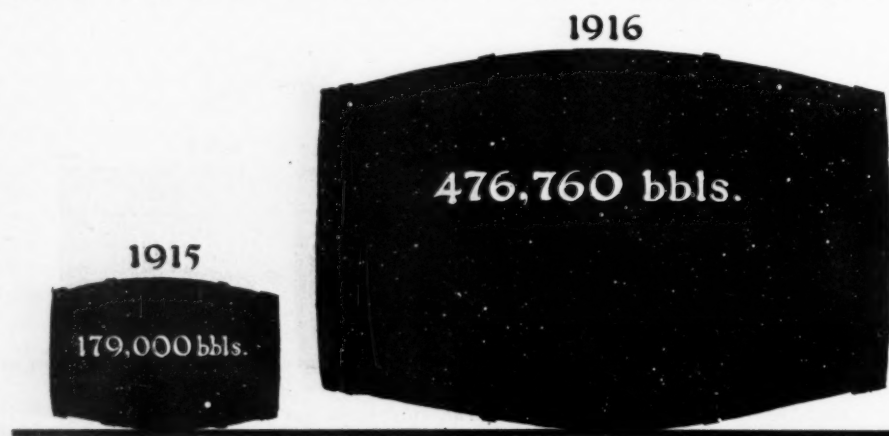
The Serlis Motor Co., which handles the Briscoe, expects to distribute 3000 cars in Kansas and western Missouri this season. Ascher C. Jones, manager, has been assured by the factory that he will receive the full quota of cars this year. This company sold less than 1000 cars last year and expects a 300 increase over that showing.

#### A Record Each Year

The Overland factory branch for the greater part of Kansas and a third of Missouri has made a record each year of its existence. Although it is claimed that Chicago branches do the largest business in the country's distribution, it has a much greater population of country to work in; therefore, the showing made by the Overland Company in its Kansas City territory demonstrates that there are undoubtedly much greater possibilities in Kansas City as a midcontinental distributing point than Chicago can hope to hold and adds to the endorsement of Kansas City as the strategic point in the car distributing business of the United States. The company has shown an increase of 100 per cent each year of its existence in Kansas City and it was one of the first in the district. The allotment for 1917 is 8000 cars. There are 175 dealers. The company received over 900 orders in the month of January. The factory was only able to ship 250 of these.

The Bush-Morgan company has Kansas, western Missouri and Oklahoma territory. It has been allotted 800 Paige and 1000 Dort cars for the coming fiscal year. Mr. Morgan stated that it had been unable to keep up with the demand for Paige cars during the last year. He attributes the large business in western Kansas to the wheat crop and generally prosperous conditions throughout the country. The company expects 100 per cent increase over last year's sales.

The Midwest Haynes Automobile Co., having the west half of Missouri and all Kansas and Oklahoma, states that it experienced a 60 per cent increase between the years 1915 and 1916, these figures based on cars procurable only, the orders for



Flour receipts on the Kansas City market were 476,750 barrels in 1916 against 179,000 barrels in 1915





*Receipts of cattle in the middle southwest last year were 2,177,468 against 1,860,235 in 1915, with the highest prices ever seen for all classes*

Haynes being far in advance of the supply. Mr. Cook, the manager, says that this year will see a 50 per cent increase over last year as it expects to turn 550 cars. A majority of the sales outside of Kansas City have been in towns whose prosperity is based on oil and mining returns and manufacturing and commercial facilities.

The Bond Motor Car Co., selling Saxon cars in the west half of Missouri and the entire state of Kansas, announces a 100 per cent increase in sales so far this season. This is explained by the growing interest in the light roadster type of car. Farmers have purchased this car for business as well as pleasure because of the increased facilities of a light car on bad roads. The factory branch allotment is double that of last year. This company has 300 dealers in the territory.

#### Increased Business Everywhere

The Greenlease Motor Co. of Kansas City has experienced the same unusual increase in demand for motor vehicles. The Cadillac has always had a corner on a certain class of business and the demand is always considerably in advance of the cars procurable. Nicols, sales manager, says that in the last ninety days more cars have been distributed in the western half of Missouri and northeast half of Kansas than in any six months previous. They have delivered more cars in Kansas City in the last six months than during all of last year. Furthermore, they are away behind on their deliveries now and the driving season has not opened. The orders on file at present will take all of the year's allotment. What the Greenlease people will do then is a mystery. A record was made during four days in December; 208 cars were sold to individuals in the territory. There was a 100 per cent increase between 1915 and 1916. The main difficulty is the failure to receive cars, due mainly to the freight embargo. In short, it is due to a scarcity of freight cars in the East.

F. D. W. Sudrow of the Chevrolet Motor Car Co. has enlarged the branch offices to a great extent. The firm now occupies the seventh and eighth floors of the new Firestone Building. Two years ago the branch had only twenty-six dealers; to-day it has 250 and embraces half of Missouri, all of Kansas and the north half of Oklahoma, also part of Idaho, Utah, southern Iowa and southern Nebraska. All prospects for a big year are the best ever known. The recent advance in price from \$490 to \$550 does not seem to affect the demand.

The Kirkland-Daley Motor Car Co., Studebaker cars, holding about thirty-four counties in Missouri and Kansas, announces a 100 per cent increase for the year 1916 over 1915. It is a fact that fully 50 per cent of the cars sold through this branch are sold to farmers. This company can see no difference in its sales due to oil, gas, or mining prosperity.

The Automobile Trade Association of Kansas, an incorporated association, has begun active work on the many problems facing the Kansas dealer and driver. The officers of the organization are: W. H. Imes, president, Topeka, Kan.; J. S. Stover, vice-president, Lincoln, Neb.; A. B. Kirkpatrick, treasurer, Topeka, Kan. Kenyon Riddle, Topeka, Kan., is secretary and manager. The main purpose of the organization is to bring about good roads legislation and dealers' protective legislation. It is a well known fact that there is little real protection for garage owners against fraud. The old Mechanic's Lien law that was passed in 1913 applied only to work and material put on horse-drawn vehicles. The new law, if passed, will enable the garage owner to hold the car he has put his time and material on until he receives his reward. Under the 1913 law it was possible to place a lien on the chattel, but such action required much legal red tape and was not effective.

However, a good share of this loss may be made up later in other crops. At least high prices will maintain a big crop-sale figure and the farmers are not going poor, far from it.

#### Record Year in Products

Kansas City, the market for most of the agricultural products of the district, had a record year in several of the items. Total grain receipts were 115,650,000 bu. Wheat receipts were 77,785,650 bu., against 58,693,950 bu. in 1915. There was a top price reached late in the year of \$1.94 against the top price of \$1.61 in 1915. That is a jump of 33 cents a bu. and when you get into figures of millions of bushels it means a tremendous increase.

Flour production also established a record, both in volume and in price. The top price was \$9.30 a barrel—double the price of ordinary times. This turned the demand to cheaper grades and consequently spread out the money.

Flour receipts in Kansas City were 476,750 barrels in 1916, against 179,000 barrels in 1915; shipments were 2,862,000 in 1916, and 2,494,500 in 1915.

Corn receipts at Kansas City showed a gain of about 1,400,000 over 1915, at 22,186,250 bu. This was second only to the record of 1914—but the price passed the dollar mark.

Hay receipts were 31,635 cars, compared with the phenomenal year 1915, when 36,635 cars were received. Prices were generally below the levels of corresponding dates of previous years, until December, when alfalfa rose to \$19 and \$20 a ton.

## Kansas City Show 50 Percent Bigger

Kansas City, Mo., Feb. 17—The Saturday-night gate receipt report, at the closing of the annual motor car show, shows a count of 195,000 total attendance of the week, 70,000 greater than in 1916. The out-of-town attendance is estimated at 65,000 and 3300 out-of-town dealers registered through the week. A census among the dealers of the business done during the week brought nothing but optimism; in fact, the general report was that sales were better by between 50 and 100 per cent than last year.

#### Prosperity Sponsored Interest

The tremendous increase in show interest is naturally sponsored by the unprecedented prosperity of this section, particularly Kansas, Oklahoma and Western Missouri. A minor factor was the ideal weather which prevailed through the week and the perfect country roads which have existed all winter, permitting the rural residents to drive to the show, and in some cases from considerable distances.

As for the show itself, considering magnitude and method of layout and decoration, it was a triumphant superiority over the record breaker of a year ago. There was a total of 248 cars shown, which compares favorably with Chicago's total of 274. Of these 204 were passenger cars and the balance trucks. There were twenty-seven chassis, eighty-eight touring cars, forty-nine roadsters and forty closed cars.

The closed cars are a coming thing in this section, even in the small communities where nothing but dirt roads are found. The buyers are appreciating the summer and winter features of the sedans and convertible coupes. Abetting this demand is the fact that the roads this winter have been smooth and dry with practically no rain, snow or mud. Driving and even touring has been going on all winter. Another type which is beginning to meet with favor is the four-passenger roadster. Although the East took to this body type first the Western demand is now growing at a surprising rate. The call in the middle southwest is for a touring car which embodies facilities for carrying plenty of baggage in an inclosed place, and as yet the factories have done little to meet the demand. Southwestern dust eliminates satisfactory use of rear trunk carriers or running-board racks.

# Cars Delivered on R. R. Schedule

## Trains of Buicks with Conductor and Traffic Manager—How Chicago Gets Allotment

CHICAGO, Feb. 20—Driving motor cars overland in trains having a pilot and a conductor on definite schedule with a train dispatcher, track maintenance crew and all the other features of a well-regulated railway system has been the outgrowth of the almost complete embargo of motor car freight on railways since the first of the month. The U-boat warfare which resulted in the embargo declared by thirty railroads has resulted in tying up more than \$10,000,000 worth of motor cars in Detroit, but it also has resulted in the development of a new method of getting cars to dealers in quantities, independent of freight conditions, and one which probably will be one of the chief features of delivery to dealers even after railroad conditions become normal.

The Buick branch at Chicago during the last week has received over \$1,000,000 worth of motor cars from the factory at Flint, Mich., by overland delivery. This has been made possible only by the very finest organization and most complete arrangements for getting the cars out of the factory and seeing that they are put over the road without delay and without accident.

### Cars No Worse for Drive

All winter cars for the territory tributary to the Buick branch at Chicago have been driven overland in small quantities but, with the increase of congestion at the beginning of this month, it became necessary for all the dealers served from this branch to depend almost entirely on cars driven over the road for their allotments. Since Feb. 6, when the first quantity delivery of Buicks to this territory commenced, over 1200 Buicks have conquered snow drifts between Flint and Chicago, and with a few exceptions all have arrived in as good condition as when they started, needing only a washing and polishing. Feb. 6 fifty-three cars were sent away from the factory to the Chicago branch, and since that time as many as 130 a day have been making the two-day trip to the local branch. Only two of these during the entire time have had to be abandoned temporarily and those on account of irresponsible drivers sent out on the first day.

To accomplish this has required a very thorough, if hastily arranged, organization, and for this much credit is due to Manager Burke of the Chicago branch, who was chiefly instrumental in installing the system. Manager Burke's office reminds one of the train dispatcher's office from some mammoth railroad system. Every minute reports are coming in by telephone and telegraph from some one of the 250 to 300 cars that are on the

road to-day. He has his finger on every one of them and has special representatives from the branch at five different points along the route.

The pilot knows the route thoroughly and has a list of stopping places. Each driver is supplied with a list of the towns passed through and definite controls are established. The drivers are instructed to pay no attention to the cars behind them and to make no stops unless the car is in front of them stops. The last car, carrying the conductor, carries also such spare parts as valves and spark plugs, two shovels and a tow rope for work in the drifts. If any car should stop on account of difficulties, all those behind this stop and the conductor can render first aid.

### Pilot Watches for Trouble

In case the last two cars do not show up at any control, the pilot goes back in his car to see if additional aid is necessary. The branch at Chicago is notified whenever the train reaches a control and is notified from the nearest town if there is a case of unavoidable stoppage. This usually can be done within 15 min., and should a new part be necessary it can be on the way from the Chicago branch within 30 min. after the accident happened. Special representatives from the factory are stationed at Bryan, Wauseon, Kendallville, South Bend and LaPorte and Valparaiso and are in constant touch with the factory.

The exceptionally bad weather conditions during the time the driveaways have been under way have increased the difficulties very much. Below zero temperatures and roads impassable with snow-drifts made it necessary to take exceptional measures to keep the roads open. The Buick factory helped materially in this by having eight or ten trucks on the road all the time, filled with men and shovels who kept the drifts cleared out between Flint and the point where the road joins the Lincoln highway. The mere passage of the trucks themselves over the roads helped in keeping the way open.

### TO CONTROL TORBENSEN AXLE

Alma, Mich., Feb. 19 — The Republic Truck Co. is planning to obtain control of the Torbensen Axle Co. of Cleveland. The plan will allow the Torbensen company to continue the manufacture of axles for practically any concern that wants to purchase them and calls for an increase of capital stock in the Republic company, whereby 15,000 shares of new stock would be offered to stockholders at \$100 per share. The Republic company expects to get control of all the issued common stock of the Torbensen concern.

There were some human elements which also added to the difficulties, particularly at the early stages of the driveaways. One of these was the avarice of the farmers along the route, who attempted to grow rich suddenly by charging fees of anywhere from 25 cents to \$1 for each car for permission to go through their fields to avoid impassable drifts. Over-zealous local authorities in one instance caused a great deal of delay. This was in South Bend, where every driver was arrested, and taken to the police station for passing through the town without a license.

Though no fines were assessed, delay and trouble were caused by the short-sighted authorities. As soon as the business men of the town, however, became aroused to the fact that the trains were being detoured around the city, pressure was brought to bear, which caused a decided change in front of the local authorities. So much so in fact that a policeman now meets each train, gets in with the pilot and acts as pathfinder to the hotel or garage and thence to the outskirts of the town with all courtesy.

The cars have come through none the worse for their experience; in fact, the engines have been in better shape when they arrived than when they started. The bodies have needed only washing and polishing to restore their brilliant finish. Of course it is a little more expensive than freight shipment. The freight charge from Flint to Chicago is \$18.50. Cars are sent overland now at an average cost of \$22.50. This has come about through proper organization and improved weather and road conditions, as the cost was double that at the first of the month.

### Rules Are Stringent

Arrangements for getting the cars away from the factory and keeping them in an uninterrupted movement over the roads are as complete, and the rules are as stringent as they have been for the truck trains operating with the army in Mexico. Burke is in touch with his dealers throughout the states of Wisconsin, Iowa, the northern peninsula of Michigan, Illinois and northwestern Indiana and notifies them when they can get cars at the factory. The dealer then notifies Burke of the number of cars of each type wanted and brings with him to Chicago one man for each car to be driven back. The Chicago branch then makes arrangements for special cars and, in some instances, special trains to take the day's allotment of dealers and their men to Flint. Breakfast is served on the train before it reaches Flint, and buses meet the men at the station and they are hurried to the factory.

Arrived at the factory, the dealer hands to a representative of the Chicago branch his check for the cars he is to get and he is given a numbered requisition for each car. When the dealer arrives at the factory, these cars are ready for him. The factory, which has been notified previously as to the dealers' wants, has been working all



night getting the cars in shape for the drive. Each car is tuned up for the road, has had its radiator filled with a mixture of water and alcohol, has 10 gal. of gasoline in the tank and has oil and grease. As the dealer turns his requisitions over to a dispatcher at the factory, the cars are called by number and the dealer's driver takes his place in the car and is away.

So well worked out are the plans that there is only the slightest delay at the factory. One instance will show the quickness with which the cars are gotten away. One of the Grand Trunk trains got into Flint the other morning at 8:30 with a party of dealers and men, and 20 min. later the first cars had started on their way to Chicago. At the present time 275 cars a day can be got away from the factory for their overland drive.

### In Chicago Territory

**C**HICAGO, Feb. 17—Seriousness of the car shortage situation is exemplified by the fact that in the last week the Oakland Motor Co., Pontiac, Mich., has not shipped a car from its factory by train. Practically every company in Detroit and other Michigan points are obliged to make what shipments they do on flat cars. Even though the present situation is severe, there promises to be little hope of betterment for a month, even if the plans of the railroads and the Interstate Commerce commission move along the most ideal lines. Practically every available car will be used to rush foodstuffs to the East and with such a large number of cars tied up on sidings in the East awaiting unloading, and a curtailed number of available locomotives on some roads, it does not augur well for the motor industry. Dealers in Chicago predict that unless the situation improves soon it will be necessary for every dealer who wishes to sell cars to go to the factory and drive them through to his city.

Michigan for the last few weeks has seen great bodies of cars sweep down through the state toward Chicago and the territory contiguous to Chicago. The Tennant-Oakland Co., handling the Oakland in the Chicago territory, drove ninety cars from the factory last week and forty-two this week. The trip from Pontiac averages 28 hrs. Roads are anything but good.

#### Freight Car Situation

Chicago is getting not to exceed 60 per cent of its requirements in freight cars, but everything being furnished must go for handling foodstuffs and perishables. Cars are being cleared through the Chicago yards in 48 hrs., according to H. C. Barlow, traffic manager for the Chicago Association of Commerce. Mr. Barlow made the statement that the railroads are now prepared to handle business more effectively than at any other time in several weeks and if the weather keeps good it will only be a question of thirty days before the situation will be almost, if not quite, back to normal.

The Falls Motors Corp., Sheboygan Falls,

Wis., is forwarding engines to its customers beyond Chicago in carload lots by express because of the freight traffic situation. One of the largest users of Falls motors is the Grant Motor Car Corp., Cleveland, and several express cars are loaded each week to keep the factory supplied with motive units while the freight tangle continues.

#### More Cars in Columbus

The Hudson Company drove 125 cars to Columbus from the factory in Detroit and from this point shipped them to various parts of the country. Available cars in Columbus are more numerous than in Detroit.

The Haynes Automobile Co. of Kokomo, Ind., is driving cars overland. Fifty touring cars were delivered to Detroit, Mich., in this manner last Tuesday, and twenty-five cars left for the same destination last Friday night. Since the freight embargo delayed shipments the company has shipped cars under their own power as far east as Johnson City, N. Y., a distance of 790 miles.

Manager Dashiell of the Chicago Dodge branch has had a crew of ten men on the road all of the time since December 1. He now has twenty men in constant trips and is getting in thirty to forty cars a week overland. In addition Dodge cars have been shipped through the winter in express cars holding from four to five motor cars. Now, however, the embargo is being extended to shipments by express. Dashiell is increasing his force of drivers and has them under a picked crew manager.

#### 10-ft. Drifts

Chicago, Feb. 19—Both snow drifts and mud have increased the difficulties of road delivery. Snowdrifts 6, 8 and even 10 ft. deep were encountered and one crew progressed 6 miles in 6 hr. 45 min., most of which was accomplished by hand shoveling. Another crew reports the use of 20 teams all night on one trip.

Now that the temperature has moderated many of the crews are driving at night, stopping when the sun softens up the roads to mud. This is to prevent one of the chief difficulties of overland delivery—mud spots on freshly varnished bodies. Those with enameled bodies do not have as much difficulty as the mud does not seem to affect them so much as it does the varnished surfaces.

Several dealers report that by covering the bodies with a coating of prepared wax without polishing, the varnish is entirely protected from the mud. The wax is later washed off with gasoline and the original polish reappears.

## Freight Embargo Ties Up Cars

### Driveaways and Express Shipments Resorted to—Snow and Mud Worry Road Crews

**D**ETROIT, Feb. 19—More than \$10,000,000 worth of motor cars are tied up here because of existing freight conditions produced by embargos declared by thirty railroads since the beginning of the U-boat war. These figures are based on a statement made by J. S. Marvin, general traffic manager of the National Automobile Chamber of Commerce, who says unless something improves matters radically in the next few weeks the situation will become even more serious. Mr. Marvin found more than 25,000 empty freight cars tied up in Chicago.

The Packard company has about \$1,000,000 worth of cars tied up and is driving its products to Toledo, Cleveland and Columbus. The Ford Motor Co., which requires at least fifty empties daily, is getting from six to ten each day. Dodge Bros. are sending cars under the driveaway rule and are shipping an average of 150 a day. The Cadillac Motor Car Co. has 1000 cars ordered, paid for and ready for shipment which it has been forced to place in storage because of lack of shipping facilities. The Paige-Detroit company is in the same position with a similar number of cars.

The Chalmers company has 300 cars in storage and is threatened with a shortage of material. More than 400 cars lay idle at the Hupp Motor Co. plant with little prospect of early shipment, and the company has been paying express charges of \$250 a day to get materials from Cleveland.

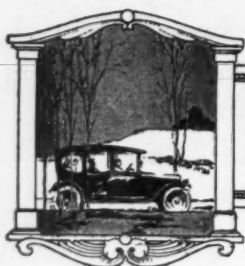
Maxwell, Hudson, King and other big concerns are having the same troubles and all are busy fitting their products for the drivers from the different agencies who come to drive the cars over the roads to their home towns. Many companies are driving their cars to nearby cities, where they hope to secure better shipping facilities.

#### BREAKS PRODUCTION RECORD

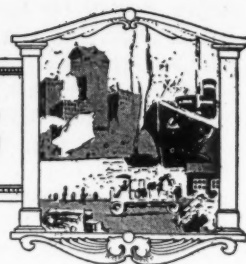
Detroit, Feb. 19—On Jan. 31, the Continental Motors Co. at Muskegon, Mich., turned out 360 finished engines, which is forty-six engines more than it ever turned out in a single day. During January the company produced 6536. The December record was 5556.

#### MULFORD TO DIRECT RACERS

Detroit, Feb. 19—Ralph Mulford will hold the star racing wheel for the Hudson Motor Car Co. this year. There will be at least five super-sixes in the racing game for 1917. Arthur Hill, formerly of the Peugeot team, will be the manager, and Billy Chandler will be master mechanic and in charge of the pits.



## EDITORIAL PERSPECTIVES



### Tractors Are Developing

THE farm is being powerized just as the motor car powerized the country during the last 15 years. Tractor manufacture is not in the production class at present, but it is getting there as rapidly as it can. The farmer has had money enough to buy perhaps a million motor cars, and he is now ready to buy a million or more tractors. The 6,000,000 farmers in the country surely should be able to absorb that many machines and it may be double and treble that number.

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TRACTORS for the farm are coming, because higher farming efficiency demands them. Powerizing the farm with engine power means more than a mere substitute of the gasoline engine for the proverbial horse. The tractor makes intensive farming necessary. Agricultural chemists have proved that land plowed in July produces much better crops than land plowed in other months. This applies to winter wheat. There is a chemical explanation for it. More nitrates are retained in the soil. It is not imaginary or even guess work. It is a demonstrated fact. Now the farmer has not done nearly so much plowing in July as he should. The Kansas farmer with humanity sticking out all around has not cared to work the horse in the heat of July and by his humanity has been losing money. For next year 25 per cent of the winter wheat in Kansas will have to be plowed up and other crops sowed. This largely could have been overcome, so the chemists say, by plowing in July. Here is where the tractor becomes

more than a mere substitute for horse power. It becomes an intensive farmer: in short, a scientific farmer.

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THIS is but one example of what powerizing the farm means, and it is no wonder that tractor makers are enthusiastic and that scientific farmers are trying to tell all other farmers just why the tractor is necessary to supply the wants of this great nation. Already we are not growing enough grain for home use, and to care for our exports. We have really been importing. The tractor will not only make farm work quicker, but it will make it better, and best of all will increase the yield from a given number of acres.

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THE great Mississippi valley, the finest farming land in the western hemisphere, will be a richer valley because of the farm tractor. It is possible that bread in the city will be a moiety cheaper because of the farm tractor. The engineering world really has accomplished more than it set out to accomplish, because it was to sell tractors that started the movement and the thought of greater production along the lines outlined were not known of at that time. Every invention brings with it unlooked-for benefits, and while the tractor can work 24 hours a day in July if necessary, it is not only saving the horse at such times but it is also adding to the annual income of the farmer.

### Compulsory Driveaways

IN years past, it was one of the favorite methods of large dealers in attracting attention to some large delivery of cars to their territories and in getting their sub-dealers together to meet them all at the factory and amidst much red fire and enthusiasm, deliver the cars overland in a great cross-country parade. This winter it is an almost hourly occurrence in our larger car-manufacturing centers.

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NOW there is little of the display that characterized the starting of the driveaways of other days. Instead of being a good publicity stunt it now is a matter of sheer necessity, if the dealer is to receive his car without a delay of weeks or months. The railroad freight traffic situation is accountable for the delivery of hundreds of cars under their own power every day from Detroit and the other motor car manufacturing centers.

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TO deliver a car in this way for any great distance need not be considered a financial saving to the dealer, for it

costs as much if not more than the usual freight rates. One Chicago dealer estimates an expense of \$30 for every car he brings overland from Detroit. However, it does offer the dealer an opportunity to get to the factory with those who are working in the territory with him. Wherever dealers gather, tales are told of twenty to fifty cars stuck in mud or snowdrifts on these enforced reliability tours. For the driveaway suffers all the road hardships also.

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QUITE naturally, the dealer and the motoring public is impressed first by difficulties of delivery of the finished car. There is another angle to the situation which may become of even graver import. That is the fact that it is almost as difficult to get material and fuel into the motor car factory as it is to get the completed product away. Most of the manufacturers have been sufficiently far-sighted to see that their stocks are, so far as possible, on hand. But if the present congested state of freight transportation continues, we may look for very decided curtailment in production.

### Pre-Touring Issue

THIS week—Vicksburg and New Orleans; April 5—Vicksburg and New Orleans and the rest. For if you have been reading MOTOR AGE each week you learned last week what April 5 meant—the annual touring issue and the biggest, best and all the other desirable superlatives that could tell you MOTOR AGE had in store for you the most helpful, practical issue yet published for motorists.

THE map this week shows you some of the possibilities of travel down in the region of Vicksburg, Miss. and New Orleans, La. Of the north and south routes the Jackson highway takes you all the way to New Orleans. Jackson is the center of roads that lead to New Orleans and to Vicksburg, as well as west and north and the coast line goes through Pass Christian, Gulfport and Biloxi, which together are often re-



ferred to as the Riviera of America. The river line goes through Baton Rouge to Jackson and from there to Vicksburg and its national monument.

WITH New Orleans most Americans are familiar. Situated as it is, near Lake Ponchartrain, Lake Maurepas and Lake Borgne, the city offers an ideal objective point for motorists who like to fish and hunt. Famous as it is for its carnival, the city needs no further reason for attraction to itself.

JUST below New Orleans, you remember, General Jackson won his victory in a post war battle in 1915. Both Missis-

sippi and New Orleans are of historical interest. Both were instrumental in shaping the country's character, and in Vicksburg and New Orleans we have the acme of historical interest.

AS THE last issue of MOTOR AGE announced, each issue prior to the April 5 issue will contain a map showing the roads and opportunities of some section of the country. Vicksburg and New Orleans will be followed by other sections in which touring either is possible now or will be soon. The California coast and Arizona and New Mexico will be treated in turn.

## Twenty Cars to Travel Together from Pacific Coast to St. Louis This Spring

PACIFIC Coast motorists are planning to come enmass to the Mississippi this spring. The Advertising Club of San Francisco is sponsor for the project, and the tentative plan is to come East to St. Louis from San Francisco over the most beautiful scenic route the country offers. The immediate object is to get the 1918 advertising convention for San Francisco.

The route is planned for thirteen days. It will include the canyon of the Arkansas and the Royal Gorge and extend through the most mountainous sections of the Rockies.

Entry is limited to twenty cars, and entrance requirements have been made stringent for this reason. Each contestant must furnish a cash bond of \$100 to bind his entry, and other restrictions are to be announced later. Several entries have been received and tentatively accepted. There in all probability will be more applicants than places.

This is the proposed routing:

First day—San Francisco to Truckee.  
Second day—Truckee to Tonopah, Nev., via Reno.  
Third day—Tonopah to Ely.  
Fourth day—Ely to Fish Springs, Utah.  
Fifth day—Fish Springs to Salt Lake City.  
Sixth day—Salt Lake City to Grand Junction, Colo.  
Seventh day—Grand Junction to Glenwood Springs.  
Eighth day—Glenwood Springs to Salida via Buena Vista and Leadville.  
Ninth day—Salida to Syracuse, Kan., via Pueblo.  
Tenth day—Syracuse to Hutchinson.  
Eleventh day—Hutchinson to Kansas City.  
Twelfth day—Kansas City to Columbia, Mo.  
Thirteenth day—Columbia to St. Louis.

### SAYS POET-LARIAT MORRIS

Seattle has a semi-official poet who sells Moon cars. He not only sells Moon cars, but he writes Moon lyrics. Whether the name has anything to do with this seeming failing is unknown at present, but this particular poet likes the name. All the moon verses he writes are published under the general caption "Moonlight."

"I suppose folks have said, 'There's a full Moon,' forty-seven thousand times when they have seen the Moon touring car gliding along with seven or eight passengers and the family dog abroad," says Morris. "It seems to be an irresistible impulse inhumanity to make puns, so what's the use to worry. I guess Mr. Moon can

stand it, and I think it helps the Moon car along."

### COULDN'T FOOL THE HORSE

"There's one thing they've all got to say about the Moon," chimes in Supt. R. L. Cleveland of the plant, "the Moon motor car never is in eclipse."

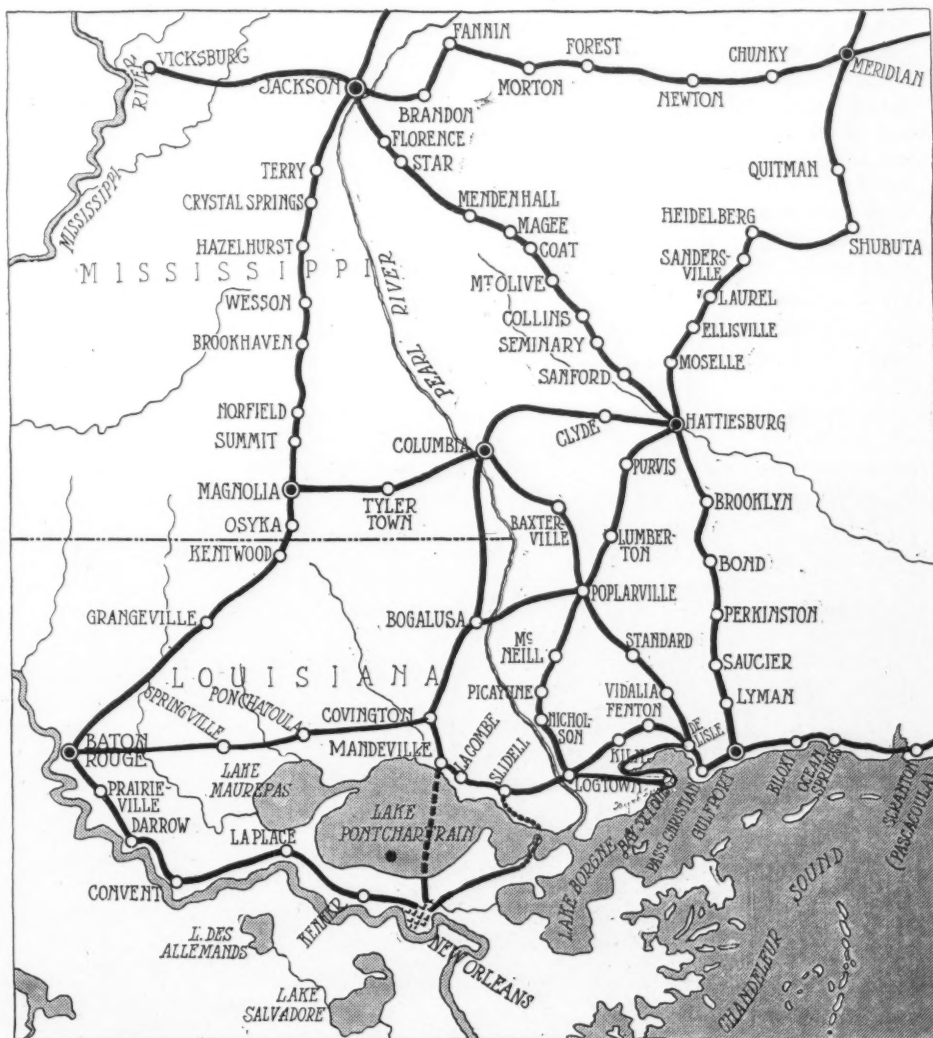
"And it shines for all," adds Poet-Lariat Morris.

M. O. Reeves, Columbus, Ind., built a motor car about the time of the first Haynes, two months later to be exact.

When he built his car he had a harder time testing it than he did building it. If he took it out on the country roads it frightened every horse that came within sight at it. But Mr. Reeves thought he could fix that.

A papier mache horse head and a bridle were his instruments of fixing. He attached the bridle to the head. He fastened the head on the front of the car. He started out.

"But it never fooled a single horse," he tells now. "All of them knew there was something unusual going on and tried to run away. My brother said he thought the main trouble was my neglect to tie a horse tail on the rear of the automobile."



Map showing roads in Vicksburg and New Orleans section

## Will Help Makers Prepare Government to Further Manufacture of Munitions

WASHINGTON, D. C., Feb. 19—Special telegram—In the event of war the motor car industry undoubtedly will be called upon to make motors, tractors, armored cars, trucks, motor boats, airplanes and some pleasure cars, and plans are under way by which the Government will educate motor car and accessory factories to the making of munitions during peace times. This statement was made by Howard E. Coffin, chairman of the Council of National Defense, which organization has just completed a survey of 27,000 manufacturing establishments in this country as a preliminary to determining just how each of these best may serve the industrial army in the event of war.

### Cars and Munitions Both

Mr. Coffin stated that not all the motor car plants would be relied upon for motor vehicles, but that a big proportion of them most probably would be converted into plants for the making of munitions. Accessory plants probably would make small fuses and similar small parts of munitions. Some motor car plants would be relied upon for shells and munitions of like size and importance. Others would manufacture still different articles, but all would be coordinated. This will be accomplished by small orders from the Government for certain articles to certain plants so that manufacturers will not be called upon to undergo expense or disturb working conditions to any appreciable extent, but that a

trained crew be provided which could be fallen back upon in an emergency to undertake the carrying out of extensive orders to extend the craftsmanship acquired to fellow workers and to facilitate the change over from peace production to war production. A meeting will be held here this week to amalgamate forty patriotic and defense societies with the Council of National Defense.

### CHICAGO SERVICE MEN ORGANIZE.

Chicago, Feb. 16—Permanent organization of service representatives and stock keepers of the leading dealers in Chicago, which is under way, is expected to crystallize the methods of the local service departments and stock rooms. The association had its inception at a dinner given early in the month by Arthur Jones of the Arthur Jones Electric Co. The purpose of the organization is to exchange ideas in order to raise the standard of service to car owners to its highest point.

### READY FOR ASCOT SWEEPSTAKES

Los Angeles, Cal., Feb. 16—Three different types of sixteen-valve engines mounted on Stutz chassis are nominated for the Washington's Birthday Sweepstakes on Ascot speedway, Feb. 25. Earl Cooper will use the same car he has campaigned for two seasons. He has three of the four original motors used by the Stutz company and two chassis, Gil Anderson having the

remaining complete car. Billy Taylor has the fourth chassis on which is mounted another type of sixteen-valve Wisconsin motor which employs the double camshaft and is known as the Peugeot type. The third type of motor, known as the "B sixteen valve," will be used by James Delno in an H. C. S. stock chassis. Cooper, Taylor and Delno will meet for the first time at Ascot. Last season Delno hung up new records at Phoenix and Tucson in his car.

### Wealthy Men Enter

Gilded youth will be very prominent in this race, unless some of the young financiers who have announced their intention to drive withdraw. William Weightman is one of these, Cliff Durant, another and John Boling of Oakland, the third. Fred Newman, who is financing Taylor, is a wealthy Oklahoma cattleman. Boling has the Mercer that Spencer Wishart made famous. Among the others to appear will be Louis Chevrolet and Boyer in Frontenacs and Eddie Pullen in a Mercer. The race will be for 100 miles and a purse of \$5,000. A juvenile contest will provide the preliminary. As this will be the last race of the season a large crowd is expected.

### RECORD DESPITE STORM

Frederick, Md., Feb. 17—Frederick's third annual motor show came to a close last night. Forty-one cars were shown by twenty-four dealers, and they included, with three exceptions, the same cars that were shown at Baltimore. The exceptions were Hollier, Regal and Crawford. Thursday's snow storm kept down the attendance, though up to Wednesday night several thousand more had visited the show than last year. Many Baltimore dealers



This Jeffery Quad hauling a French 120-mm. gun which is slightly less than 5-in. bore was photographed in the Somme district. Details of construction of gun carriage wheels are not known.



exhibited at Frederick to obtain dealers in that sections, and some of them were successful.

The armory was well lighted, and a lattice effect of white for the entire ceiling gave an effective setting. Potted palms were placed on various columns. The show was very crowded and it was difficult to pick out the various exhibits around the sides.

Besides the cars shown, there was an exhibit of Cleveland Standard tires by the Akron Tire & Rubber Co. of Baltimore and a large accessory exhibit by the H. & H. Co. of Frederick.

#### Wednesday Set Mark

On Wednesday Major John D. Markey, who is in charge of the exhibition, stated that more persons visited the show that day than attended the 4-day exhibition of last year. Farmers for miles around attended, and since the section has had big returns from their products for the last year, the dealers believe that the show will result in big buying. There were many sales of commercial cars. While there were only pleasure cars on exhibition a variety of trucks and light delivery wagons were shown in the various show rooms in the city. Ed Allen of the Rice Motors Co. of Baltimore, Jeffery distributor, drove a Jeffery quad from Baltimore in the snow storm and then showed the power of the machine by driving up a steep grade in the rear of armory. This was said to be the first time a motor vehicle had attempted to climb the grade.

#### TO BUILD BODIES

Oshkosh, Wis., Feb. 19—The Clark Carriage Co., Oshkosh, Wis., for many years manufacturer of horse-drawn vehicles, is effecting a reorganization and will engage in a large production of all kinds of bodies for motor vehicles. H. M. Clark will remain as president, and the factory management will continue to be in charge of H. M. Foulke.

## Cars Ready for Omaha Show

### Sixty Exhibits Will Display More Than 200 Vehicles

OMAHA, Neb., Feb. 19—With sixty exhibitors already in line with more than 200 cars to place on display, and with a number of entries expected, the approaching opening of Omaha's twelfth annual motor show, Feb. 26-March 6, is awaited. The show has outgrown its previous quarters in the Auditorium, and half the length of an adjoining street has been obtained to hold its displays.

The show this year is given under the auspices of the Omaha Automobile Trade Association, a development of the old Omaha Automobile Show Association. Indications are that last year's attendance of about 1500 dealers and distributors will be nearly doubled this year. Omaha distributors are perfecting elaborate plans for the reception of visiting dealers, and for conferences, lectures and other events during their stay.

Owing to the great increase in the number of displays, both in pleasure cars and in trucks, an annex will be constructed over the whole width of the street, at the east end of the Auditorium, extending half the length of the block. Here will be housed the truck displays, while the basement of the building, heretofore used only for truck displays, has been re-christened the "palm room" and will be used for a portion of the pleasure car display. Most of the dealers wish to exhibit their full line of cars. If it is possible, there will be also a tractor display, but as at present every available inch of space is spoken for this appears a trifle doubtful unless extraordinary arrangements can be made.

A feature will be a traffic school for the public under the direction of Police Commissioner Kugel and a special staff of traffic officers. Another, which is planned,

is a school of tractor mechanics by representatives of the International Harvester Company.

#### NEW SPEEDOMETER SOON

Nashville, Tenn., Feb. 17 — The Core Speedometer Co. has been incorporated here and plans to begin manufacturing within 60 days. The company will produce a new speedometer which, in addition to registering the mileage, has a speed-control. It may be set at any desired speed from 1 to 60 m.p.h. and locked with a Yale lock, and this speed then cannot be exceeded. A car may be left standing with the control set at "0" and the key removed, making it impossible to move it. The mechanism is attached to the transmission and the housing brazed to the frame, so that it cannot be removed. The speed-control is attached to the ignition, and to disconnect it is necessary to change all wiring on the car. It is claimed that it will prevent both stealing of cars and joy-riding by chauffeurs. When sending the car out with the chauffeur alone, the owner may set the speed at 15 m.p.h., which is too slow to tempt the joy-riding chauffeur, as well as insuring that he will be driving at a speed which will eliminate accidents.

#### But Thirty-nine Parts

In addition to this feature, the instrument records the actual speed, trip and season mileage. It is stated that it contains but thirty-nine parts, reducing to a large extent the number in the ordinary speedometer. It was invented by J. H. Core, the president. The company plans, tentatively, to produce seven models. The parts are to be manufactured in Grand Rapids, Mich., and assembled at Nashville.



Success for Illinois \$60,000,000 State highway project was predicted when representatives of 150 good roads bodies and highway associations dined at the Lexington Hotel recently. The dinner was under the auspices of the associated good roads organizations of Cook County and Chicago.

## PIKE'S PEAK HIGHWAY WORKERS

## PROMISE GREATER ACTIVITY

General Manager to Endeavor to Have Entire Road  
Hard-Surfaced by End of 1919

**S**T. JOSEPH, Mo., Feb. 14—New life was injected into the Pike's Peak Ocean-to-Ocean Highway Association; greater activities that will come only with adequate funds for pushing the work is the goal set for 1917; both being results of the fourth annual convention of the association which closed a two-day session here to-night. Out of the throes of inactivity into an active campaign for a transcontinental highway that will be a credit to the name it bears is the thought engendered at the meeting yesterday and to-day. Every phase in the fundamental building of a great transcontinental highway was gone into thoroughly. The coming year will see the road with a general manager, a field man whose duty it will be to traverse the road continually and stir up enthusiasm among the residents along the road to the end that the road may be hard-surfaced from coast to coast before the end of 1919.

**Expense Is Very Low**

It must be admitted that the administration expense attached to the Pike's Peak highway stands by itself so far as any transcontinental route is concerned—not at the highest point, but at the lowest. One can understand why new life, wider activities, greater aggression is apropos in connection with this highway body when he is told that the total expense of the national

By William K. Gibbs

body in the three years it has been in existence is approximately \$1,300. Especially was the insignificance of this amount brought home to the delegation at the meeting when George E. McIninch, Missouri director of the Jefferson Highway Association, told them that the Jefferson highway, during its short existence, had expended something over \$12,000 and still had several thousands of dollars on hand.

*The Work for the  
Coming Year*

*Each state through which the highway passes will be assessed \$1,000 to provide greater administrative funds.*

*Memberships ranging from \$1 to \$1,000 will be sold to bring the financial condition of the association up more nearly on the plane of other similar road organizations.*

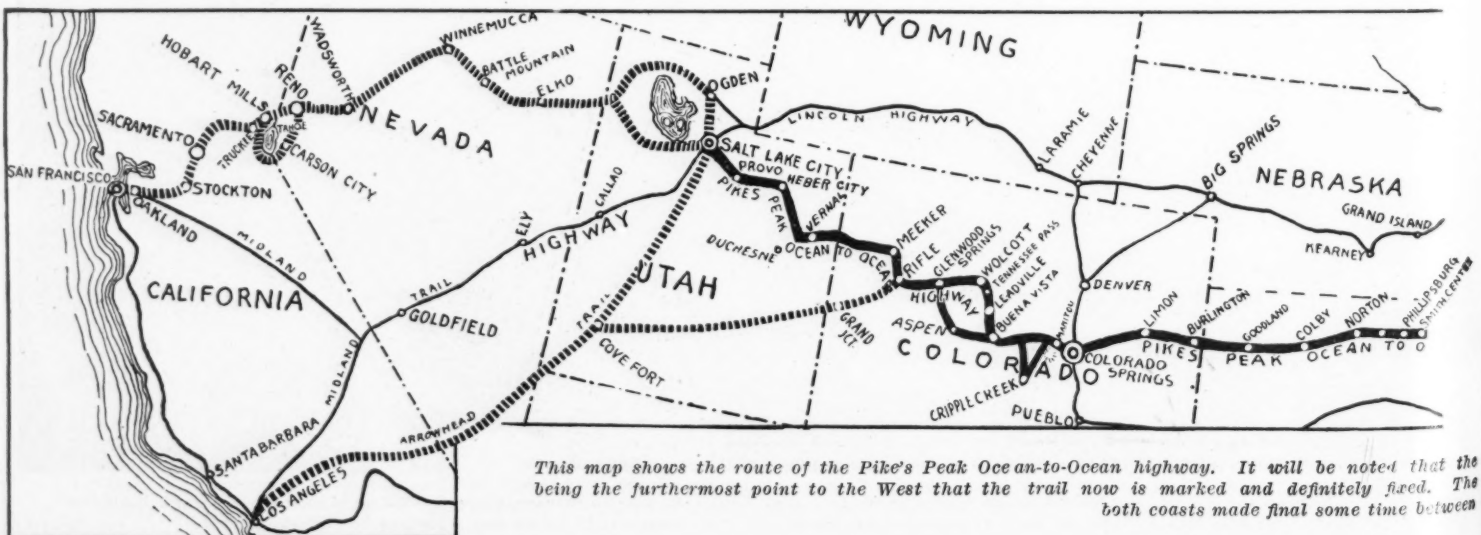
*A sociability run from East to the West will be run next summer and a summer meeting of the association will be held on the summit of Pike's Peak.*

Further, the Lincoln highway expended in administration last year approximately \$31,000. Both of these latter roads have field men and general managers who keep interest alive in the projects and thus the additional funds expended make for a higher degree of efficiency of these two highways.

Fortunately for the Pike's Peak highway, most of the states through which it passes either have state highway commissions, or are at the present time passing laws creating such commissions. Colorado, Kansas, Missouri, Illinois and Indiana Legislatures were acting upon such measures during the course of the convention and it was reported that the measures were practically certain of passage.

**Conceptions of Highway**

Many spirited addresses were made in which every effort was made to give the conception of what a highway means. A highway no longer is simply a track upon which to make short trips about the community; it is the link that connects civilization. One speaker voiced the statement that there never would have been a civil war, possibly not even state divisions, had the means of transportation and intercommunication been all that they should so that the people of one community had ready access to the people of another. The great highway movements of to-day may





be likened to the pioneer work of the railroads a half-century ago. It seems probable that the railroads' day of further expansion is ebbing; hence it is necessary that a new avenue of inter-communication must be developed, for the railroads cannot cope with the situation and come out 100 per cent efficient now; surely they cannot in the future when their earning power now is said to be insufficient to meet the demands made upon them.

The opinion was generally expressed that hard roads should be the goal and that much more benefit would accrue from expending money for hard-surfacing roads than for grading and filling. No longer is it necessary that a road be level; in fact, the undulating road has a charm that the level road does not. One Missourian volunteered to pay \$1 per front foot toward building a concrete or brick road past his place. His farm has a frontage of one mile along the Pike's Peak Ocean-to-Ocean highway and he declared that for every dollar he gave for hard roads he firmly believed the value of his land would become enhanced many times. He pointed out that if the city lot owner can afford to pay an assessment of \$40 or \$50 on his 50 by 150-ft. lot for street improvement, the farmer can well afford to pay a dollar per front foot.

#### Board of Directors to Manage

Henceforth the management of the road will be in the hands of a board of directors, which consists of the national officers and delegates from each state section, this move being made possible through a change in the constitution and by-laws. Any questions that require immediate attention will be put to a referendum vote by mail the same as members of the Chamber of Commerce of the United States of America vote on questions that require their sanction and which cannot wait until all are called together. A time limit is put on the vote and the majority of the votes received up to a certain time shall constitute the action of the whole board of directors.

Commendatory telegrams were sent to the presiding officers of both houses of

the Legislatures of Colorado, Kansas, Missouri, Illinois and Indiana, because the measures now being acted upon and which presage much highway activity during this year and in the future are so closely in harmony, creating authoritative, responsible commissions, centralized power and flexible administration as well as rightly based engineering.

History may be said to place its stamp of approval on the Pike's Peak highway as a logical transcontinental trail. Through Ohio to Indianapolis it follows the Old Cumberland trail, built by the government in 1806 at a cost of over \$7,000,000. It passes the home of Abraham Lincoln in Illinois, thence west through Hannibal, Mo., the birth-place of Mark Twain, paralleling the first railroad ever constructed across Missouri and following an historic trail. It passes through St. Joseph where the old pony express was inaugurated for the frontier, and where outfitting was done in the "Pike's Peak or Bust," days. It passes through Belleville, Kan., near the site of the peace conference between Lieut. Zebulon Montgomery Pike and the Pawnee Indians in 1896 and heads toward Pike's Peak, the goal of the pioneer and the mecca of the tourist. Entering the mountains it follows the old trail used by

the Ute Indians and passes through Colorado to Utah. It is the modern development of trails blazed by the explorer.

Let us look for a moment at the condition of the Pike's Peak highway through various states. Of Missouri's 209 miles 23 miles are hard surfaced and the balance are graded dirt. Illinois has 250 miles and practically all of it is graded dirt. Indiana has 200 miles and enjoys the distinction, perhaps, of having the most mileage of good gravelled highway of any state on the line. Ohio's part measures 250 miles, most of which is hard-surfaced. Pennsylvania has 300 miles and most of it is in good condition. West of here comes Kansas with its 480 miles across the plains. This road has been materially improved in the last year and with the new highway laws in effect will show much improvement this year. Colorado's division of the highway measures 500 miles and while parts of it need rebuilding, much work was done in the last year and much is contemplated.

#### The Trip Worth While

The writer recalls a trip from Colorado Springs to Glenwood Springs last year through the heart of the Colorado Rockies that was made with ease and comfort, and work under way at that time will be largely completed by the time the touring season opens again, which should make this part of the route materially better. If one had to follow a cow path the scenery of this section would be well worth it, but the ultimate aim is a good road throughout the state and the time is coming at no distant date when good roads will be a reality in this section. Mountain road building presents a task that is unknown in the central states. There it must be blasted from solid rock, but once built, maintenance is almost nil. Utah now has 400 miles of the Pike's Peak highway, but with the western extension so largely in question it is difficult to say how much this state may have when a decision is made.

Invitations have been extended to the association to make several points on the Pacific coast the western terminus of the highway, but so far no action has been taken. F. V. Owen, secretary of the Ar-

### Future of the Pike's Peak Highway

*Not only a good road, but the best road from coast to coast, is the only thing that will satisfy its sponsors.*

*A hard-surfaced road its entire length within the next three to five years.*

*A general manager and field secretary to give their undivided attention to the road in future, to the end that all sections are active.*

*Ultimately make the Pike's Peak highway a road that will be used for freight hauling as well as for touring.*



The route passes almost through the center of the United States from North to South. Just now the western terminus is undecided, Salt Lake City is suggested. The lines both east and west show the several routes that have been suggested and action will be taken on these and the most logical termini on the coast and the date touring begins.

rowhead Trail Association, came to the meeting to use his efforts toward getting his road from Salt Lake City to Redlands and Los Angeles accepted as the western link in the Pike's Peak highway. A committee has been appointed to investigate and will report what is thought best in the way of an outlet to the coast.

With regard to eastern extension, where the road originally followed the National Old Trails route from Indianapolis eastward, it now branches off at Columbus, Ohio, and goes to Pittsburgh. It uses the William Penn highway as its route through Pennsylvania and has a branch running south from Harrisburg, Pa., to Washington, D. C. The trail will go from Philadelphia to Boston by way of Stroudsburg, Pa., Goshen, Monroe, Newburg, Poughkeepsie and Millerton, N. Y.; Canaan, Winstead, Hartford, Willimantic, and Putnam, Conn.; Providence, R. I., and Taunton and Brockton, Mass. To New York the trail will go the shortest route possible through New Jersey, but the William Penn Highway Association, the Pennsylvania section of the Pike's Peak trail, is authorized to work out the details of these two extensions.

#### Needed—a Solomon

A case for a Solomon developed at the meeting in the controversy as to whether the highway should dip south through Paris, Ill., to Terre Haute and thence follow the National Old Trails route to Indianapolis. E. H. Clifford, secretary of the Terre Haute Chamber of Commerce, came here to use his efforts to put Terre Haute on the highway, while F. R. Calvert and Arthur Rohm of Rockville, Ind., on the more direct route from the Illinois line into Indianapolis, sought to induce the association to adopt their road. Clifford was one of the organizers of the highway and declared he had reason to believe Terre Haute was on the highway originally. He suggested an optional route via his city, while Calvert and Rohm were less charitably inclined. Officials of the association finally decided, with the aid of a committee, to adopt the direct route and leave Terre Haute off. C. L. McKesson, mayor of Colorado Springs and an official of the highway, declared that the purpose of the road was that of the most direct route and that the road was not to be changed to harmonize with the interests of the few, but that its aim is to serve the many and in the best possible way.

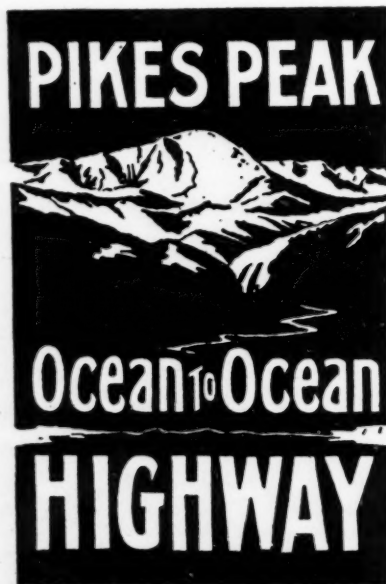
Plans were made for assessing each state \$1,000 to secure funds for the hiring of a general manager and field secretary for the year. This money will be in addition to the amount each state raises for use within its own borders. In addition to the general manager and field secretary, of the parent body, some of the states plan to hire an organizer themselves, who will continually traverse the road, approach the farmers and generally stir up interest in making better roads. Much money will be necessary for each state to put its section of the road in shape and this will be pro-

cured wherever obtainable. One small Missouri town last year raised \$2,500 by subscription and a man from that county declared that the money spent on the roads brought back fourfold returns to the town wherein the money originated.

It is unfortunate that any transeontinental highway should, even in places, overlap other transeontinental trails, for the one which was first to get a name, usually gets the support. This is the case with the Pike's Peak east of Indianapolis, where it is the same as the National Old Trails for several hundred miles. Naturally the Pike's Peak organization cannot hope to get much support from the people along that part of the road; people look upon it too much as double taxation, which never meets with favor. This puts a bigger burden on the section to the west in Indiana in supporting the organization.

In the new scheme of raising funds, memberships will be sold at prices ranging from \$1 to \$1,000. These memberships may come from any section of the country, whether or not the subscriber is on the trail or not.

Plans were made at the meeting for a sociability run from the East to the West, the exact limits to be determined later. Along with the run it is proposed to hold a meeting on the summit of Pike's Peak, this event alone to be perhaps one of the most unique highway meetings ever held in this or any other country. It is not so long ago that Lieutenant Pike and his followers admitted defeat to the towering crest of this giant of the Rockies and Pike's statement that "man's foot would never touch the top of the Peak" not only has been disproved, but now motor cars or any kind can scale the mountain and reach the top, 14,109 ft. above sea level, in a few minutes. The distance from Colorado Springs to the summit—30 miles—has been made in 45 min., which speaks well for this great feat of modern road engineering.



Official Marker of the Pike's Peak Ocean to Ocean Highway

During the meeting a telegram was read inviting the members of the sociability run to go over the highway up the Peak and also the Crystal Park road, which is equally attractive, yet does not reach so high an altitude.

Bulletins telling the condition of the road will be sent out weekly and a monthly news bulletin will be sent to all newspapers along the highway. In addition, it is planned to get out a card bearing the insignia of the highway on one side and furnish these free to clubs and associations along the route with the idea in mind of having the local club print on the other side a reasonable day's run over the Pike's Peak Ocean-to-Ocean highway in either direction from the town where the club or association is located. The side bearing the highway marker will be gummed top and bottom and this will permit sticking to the windshield. The insignia showing through the windshield will tell approaching motorists that one is driving on the Pike's Peak highway and the other side of the card will afford an easy means of keeping the log of the route before the driver.

#### Present for the Secretary

Just before the close of the meeting, Secretary A. W. Henderson, Colorado Springs, Colo., was presented with \$100 in gold as a small token of the esteem with which he and his work for the association is held. To date he has worked without salary, finding time outside his regular duties as secretary of the Colorado Springs Chamber of Commerce to devote to the work of the association. In future he will be paid a salary, according to the new order of business.

C. F. Adams, Chillicothe, Mo., was re-elected president and A. W. Henderson, Colorado Springs, Colo., secretary-treasurer. William Jennings, Harrisburg, Pa., was made eastern vice-president. He is president of the William Penn highway. George W. Hughes, Hume, Ill., was made vice-president of the central division and the western vice-presidency was left open until the western terminus has been established. The board of directors is made up of four members from each state and is as follows:

Indiana—I. S. Harold, Richmond; Arthur Rohm, Rockville; F. R. Calvert, Rockville; C. M. Moffett, Bainbridge.

Illinois—George W. Hughes, Hume; H. A. Scheidker, Hannibal, Mo.; A. M. Kenney, Decatur; R. H. McAnulty.

Missouri—C. F. Adams, Chillicothe; H. A. Scheidker, Hannibal; R. S. Brownlee, Brookfield; W. L. Connett, St. Joseph.

Kansas—C. W. Cole, Norton; A. Q. Miller, Belleville; W. R. Guild, Hiawatha; F. E. Lile, Mankato.

Colorado—J. K. Rouze, Burlington; A. W. Henderson, Colorado Springs; J. W. Dean, Aspen; C. L. McKesson.

Utah—J. P. May, Roosevelt; T. W. Sweatman, Duchesne; H. W. Harvey, Heber; G. S. Sloan, Myton.



## Traffic Signals Again

# DIRECTION SIGNAL CRITICISED

## Liability of Driver to Give Wrong Indication Is Cited

**EDITOR MOTOR AGE**—We have just sent out to 260 chiefs of police, in fact every town in the U. S. over 25,000 inhabitants, the following letter, drawing their attention to the discussion of traffic signals, just started in *MOTOR AGE*.

We are quite ready to admit that the direction type of signal is ideal, for it is always nice to know just what the other fellow is going to do, but repeated tests have brought out the weak point, that is, people will persist in giving the wrong signal.

"The city of St. Louis has just been busy in passing a new traffic ordinance and in the nature of things has stirred up such comment and criticism, as is evidenced by an article in *MOTOR AGE* Jan. 18.

"As Mr. Ash, the writer, says, the time is ripe for signals on motor cars, but before many cities adopt ordinances in regard to signals, he thinks, and we agree, that a nation-wide discussion of the subject should be made and suggests to *MOTOR AGE* that they keep their columns open for such discussion, so that the best type of signal shall be made standard, and so that the manufacturers may conform to this standard.

### Direction Signals Dangerous

"We have answered Mr. Ash and have also brought out the details of what we consider to be the only feasible type of signal, as our experience with direction signals convinces us that they are too dangerous to be adopted, on account of the liability of drivers giving a wrong indication.

"We maintain that a warning to the driver behind is all that is necessary, and no attempt need be made to indicate which direction car will turn, as it is of no consequence to the following driver just so long as he is warned of an impending change of direction or speed. Where a signal is installed, controlled by several push buttons or lever positions, the driver is open at all times to give the wrong signal, and you will agree with us that a wrong signal is worse than none at all.

"We believe, from observation, that a traffic officer at street intersections has no time to watch for a variety of traffic signals, and he will never do it. The officer watches the face of the driver for his signal, as well as for a nod of recognition; furthermore, the driver is under the absolute control of the traffic officer and must do as he says; therefore, there is no need

for any mechanical signal, in so far as the officer is concerned, a slight hand signal being given when a turn is desired as at present.

"We maintain that a signal requiring the special education of the public to its use will fall down when the farmer and tourist comes to town. A red flag and a red light, the universal warning and danger signal, have been in use for sixty-two years on the railroads. Everyone knows them. You have known their meaning since you wore short breeches.

"We take this occasion to draw your attention to the discussion of the subject in *MOTOR AGE*."—Edwin H. Roberts, manager, Denver Traffic Signal & Mfg. Co., Denver, Colo.

### 2.9 M.P.H. ON HIGH

Los Angeles, Feb. 16—To ascertain how slow a Saxon Six touring car can be operated for a protracted period in high gear, a test was made by the J. V. Baldwin Co. of this city on Ascot speedway. The standard gear ratio of 4¼ to 1 on high was used. The shifting lever was removed, and after being officially inspected the car was sent on its way around the mile track. In the 24 hrs. that the car was run it covered only 68 miles, an average of 2.9 m.p.h. The top was removed, but otherwise the car carried complete equipment, including the starting device.

### KING TAKES CLIMB TROPHY

San Francisco, Cal., Feb. 17—By climbing the 10-mile Mount Diablo grade on high gear during the San Francisco show a King eight-cylinder touring car was awarded the Oakland Tribune High Gear Challenge Trophy.

### GOVERNMENT-OWNED TRUCKS

Washington, D. C., Feb. 19—In eight large cities the United States postoffice operates 539 motor trucks in postal work, the installation of these vehicles having followed a thorough investigation by a committee of three experts in Chicago, Minneapolis and New York.

Previously the government had hired its transportation done by local teaming concerns on contracts usually covering about 4 years. These contractors by employing motor trucks so improved the service, economizing in cost at the same time, that it was determined, if feasible, to motorize the service in several prominent cities

and to have such motorization under government ownership to insure consistent and reliable service at a minimum cost.

The trucks are used for parcel post delivery and collection, inter-station work and transfer of mail between the postoffices and railway stations. They range in capacity from 750 lbs. to 3½ tons, representing eight makes of chassis.

The greatest number is in Chicago, that city having 228. Fords lead, there being 312 of these in the eight cities, of which number seventy-six have Olsen converters to raise their capacity to ½-ton. The largest single fleet of one make consists of 100 un-converted Fords used in Chicago. Following is a tabular summary of the installations:

Cities	Number
Chicago	228
Philadelphia	122
St. Louis	56
Detroit	49
Pittsburgh	48
Washington	19
Indianapolis	19
Nashville	8

### FORD OPERATES ON KEROSENE.

Chicago, Feb. 16—That the modern motor car can be operated upon kerosene or or similar low-grade fuels without radical change in the engine and by the employment of the conventional gasoline carburetor, providing the fuel is sufficiently heated, was demonstrated to a representative of *MOTOR AGE* yesterday. A stock Ford car with the stock carburetor was employed, the only change being the addition of a chamber into which the kerosene was led and in which it could be heated by the exhaust gas. The device used is called the G. P. system and is made by the G. P. Coal Oil System, Chicago. The only other change was in the use of a slightly thicker gasket under the cylinder head so the compression is lowered and a two-way cock so gasoline could be turned on for starting and kerosene for running.

In a two hours' run on kerosene the car performed in every respect as well as other Ford cars on gasoline and better than most. There was not a suggestion of smoke at any time except once when the throttle was quickly closed after the engine had been raced. There was no tendency to heat up and no tendency to sluggishness. The day was quite cold, but carburetion seemed perfect. No missing was noticed and when a handkerchief was held up to the exhaust pipe for a few seconds there was no discoloration of the linen—a pretty good evidence of perfect carburetion.

## Clarify Federal Road Aid

Bill Not Designed for Improvement of Entire Rural Routes, Says Author

Believed That Interpretation Would Defeat Purpose of the Act

ATLANTA, Ga., Feb. 16—That the United States department of justice will not interpret the act appropriating \$85,000,000 for aid of states in the construction of highways to mean that this sum must be spent for the improvement of the entirety of any rural route, of which a state may plan the improvement of a part, is the view entertained by United States Senator John H. Bankhead of Alabama, author of the act.

The postoffice department has asked the department of justice for a construction of the law which would require the improvement of the entire mileage of a rural mail route whenever a state selects a portion of such a route for improvement. The result of this would be the improvement of a number of loop highways running a few miles out of a town and back in again.

### Intent of Act Explained

Senator Bankhead, in an address before a meeting of the Bankhead Highway Association, which has been held in Atlanta, declared that any such view of the act is erroneous and would fail to carry out the intent of the act. He declared that this point was the subject of thorough debate on the floor of the senate before the bill was passed and that the bill was passed with the certain understanding that the usefulness of it should not be destroyed in this manner. The senator interpreted the intent of the act to be that portions of the federal fund going to the several states should be used by these states, under the provisions set forth in the act, for the improvement of any road used or that might probably be used in the future as a rural mail route, that it did not contemplate that thousands of dollars should be spent in improving such parts of rural routes as are infrequently traversed by traffic except, perhaps, by the rural route mail carrier himself.

Further, the senator is of the opinion that this appropriation of \$85,000,000 to be distributed over a five-year period is but the beginning of federal aid for highway improvement. He stated that it is his belief that, before the five-year period has expired, Congress will be appropriating from \$50,000,000 to \$75,000,000 for the improvement of public roads.

### BANKHEAD HIGHWAY EXTENSION

Atlanta, Ga., Feb. 16—At a conference of the Bankhead Highway Association, just closed here, plans were made for the extension of that highway from Atlanta to Washington, D. C.

At a meeting to be held in Greensboro, N. C., in March, divisional associations will be organized for the Carolinas and Virginia for carrying out the construction of the new extension of the highway. Divisional associations already have been organized in Georgia, Alabama and Tennessee. In March also a meeting will be held at Memphis, Tenn., when divisional organizations will be perfected for all states which will be traversed by the Bankhead highway west of the Mississippi river to Los Angeles, Cal.

A meeting of the national organization has been called in Birmingham, Ala., April 19, when plans will be made for locating the route of the highway and other details of reorganization and construction considered.

At the Birmingham meeting will be governors and leading road builders of many states. The governors of South Carolina, Georgia, Alabama, Arkansas and Oklahoma have already notified J. A. Rountree, Birmingham, Ala., secretary of the Bankhead Highway Association, of their intention of attending the Birmingham meeting. When completed the Bankhead highway will be the longest highway in the world, having a total lineal mileage of some 10,000 miles.

### FRENCH CAR TAX DOUBLED

Paris, France, Feb. 1—With the year 1917 all car taxes in France are doubled, this being one of the special measures to provide funds for the financing of the war. Horse vehicles of all kinds are also eligible for double taxes. Before this measure came into force there was a fairly brisk demand for touring cars and as the home factories are not producing and there is a 70 per cent duty on imports, second-hand cars brought good prices. The result of the new taxation scheme has been to throw hundreds of cars on the market, and there are now more motor cars than purchasers. Doubtless the pinch of war is responsible in a certain measure for this influx of cars on to the second-hand market, for many owners who had placed their cars in storage find themselves obliged to sell owing to their shortened means and the fact that peace does not appear to be within sight. Before the war the annual taxes on a modest 8 hp. car was \$36; now they are \$72. There is no shortage of gasoline in France and no restrictions on its use, but as the price is now 53 cents a gal. it is not used recklessly by private motorists.

### SIGN POSTS ON N. O. T.

Los Angeles, Cal., Feb. 16—Complete resigning of the National Old trails transcontinental highway from Los Angeles to Kansas City is to be undertaken by the Automobile Club of Southern California. A club crew will start eastward the latter part of this month, charting the trail and surveying locations for new sign posts.

## No Racers from Europe

Contrary to Impression Here Foreign Countries Have Few Speed Creations

General Conditions of Manufacture Abroad Outlined and Described

PARIS, France, Feb. 5—There appears to be an impression in America that Europe can still provide a few racing cars. The fact is that all the European factories have been swept clean of all their speed creations and have had no opportunities of making new ones since the outbreak of war. In August, 1914, successful racing cars were to be found in the Peugeot, Delage, Sunbeam, Mercedes, Fiat, Opel, and Nagant factories. Vauxhall had a set of cars which might have become successful if six months more work had been put into them. All the Peugeots have been shipped to America, and the Peugeot factory is incapable of producing any more machines for its race team has been broken up, its race engineer having formed an independent company to manufacture aviation engines, Boillot has been killed and Jules Goux is a lieutenant in the French army.

Delage has also sold all his cars, with the exception of Guyot's machine which finished third at Indianapolis in 1914. This has been converted into a fast runabout, for its cylinder capacity exceeds the 300-in. limit. Delage has maintained his complete organization, but is too busy on army work to produce racing machines. Sunbeam made a new motor for the 1914 Grand Prix racers and sent one to America last year, but it is understood no more have been built.

### Mercedes Cannot Ship

Mercedes possesses the most successful racing cars, but unless the British fleet can be put to sleep they will not reach America until after the war. It is known that several persons have tried to get the machines out of Germany, but have had to abandon the attempt. The Opel cars are less interesting, but they also are unavailable by reason of the blockade. Fiat has two of the last French Grand Prix cars, and it is likely that they will reach America in the spring in order to race for the new American Fiat Co., now controlled by the parent factory. These are the only available cars, and they are not for sale. The 300-hp. Fiat is at the Turin factory, where it has been lying since Arthur Duray made his attempt on the world's kilometer record. The car, however, is privately owned and does not appear to be for sale. Also its dimensions put it out of competitive racing. The Nagant factory is in Belgium and only the Germans know what has become of the set of 1914 racing cars run at Lyons.

Although there are no racing machines available now, indications are that they



will be produced on the declaration of peace. All the motor car factories have secured a strong financial position and have had wonderful experience on aviation engines. Engineer Henry, who was responsible for the Peugeot engines, states that since he took up aviation engine design and construction he has learned more than he ever considered it possible for a man to learn. Other firms have acquired valuable experience and will be anxious to show their worth by producing special racing creations. In a few cases drawings have been prepared, but of course no constructive work has been done.

### MAY LIMIT TRUCK LOADS

Lansing, Mich., Feb. 16—A tentative law has been drawn up by the truck general department, the senate and house roads committees and the state highway department, which, if enacted, will not affect any wagon or motor truck now in use in the state but will prevent overloading of all hereafter.

Shippers and manufacturers in each state have been using heavy trucks for hauls overland and have cut up many roads which were built for exceptionally heavy loads but not for gross weights of 18 or 20 tons. The new law would prohibit the operation of any vehicle the gross weight of which exceeds 15 tons, farm implements and road construction machinery excepted. Nor will it allow the operation of any vehicle which has a gross weight per inch width of tire exceeding 600 lb.

### Would Bar Metal Wheel Usually

Metal drive-wheels which come in contact with the road would be barred on all motor truck or trailers operating in the roads, except where chains and non-skidding devices are used. No motor truck or trailer could have a gage of more than 75 in., from center of tire to center of tire, and usually not be more than 96 in. wide over all or more than 12 ft. 6 in. high.

The law also includes an act providing for speed of trucks and trailers figured on tire widths and ranging from 20 m.p.h. for 2-in. tires down to 12 m.p.h. for 7-in. tires. On the basis of the maximum wheel-load in pounds, a 1400-lb. load can travel 18 m.p.h., while one weighing 6400 lbs. can go but 10 m.p.h.

All trucks and trailers now operating are to carry conspicuously the information relative to their height of wheel, width of tire, gage, width over all and carrying capacity.

Three-quarters of the gross weight permitted a truck or trailer is to be carried on the rear axle. Trucks and trailers used as buses are controlled by this act. In the case of a truck carrying a trailer, the speed would be governed by the vehicle having the lowest mile an hour rating.

During March, April and May the carrying capacity would be limited to one-half the carrying capacity in the law. Penalties are provided for violations.

## Inter-City Match Dates

### Contest Board Selects July 17-19 for Reliability Run Out of Buffalo

#### Ten Teams Only Will Be Permitted to Enter

NEW YORK, Feb. 17—Dates for the proposed inter-city team reliability match were selected to-day at a meeting held in the office of the Contest Board of the American Automobile Association, participated in by Chairman Kennerdell of the A. A. A. Contest Board, Robert Lee Morrell, head of the Metropolitan Consulate, A. A. A.; Samuel E. Hibben of Chicago, chairman of the Inter-City committee and C. G. Sinsabaugh, secretary. The dates chosen were July 17, 18 and 19, and it was decided to use Buffalo as the start and finish of the match, the Automobile Club of Buffalo having undertaken to act as host and to lay out the routes and make all hotel arrangements.

#### Teams Are Limited

It was decided at the meeting to limit the entry to teams from ten cities, each team to consist of from five to ten cars each. So far definite assurances of support have been received from New York, Chicago, Indianapolis, Ind., Detroit, and Buffalo, N. Y., while Philadelphia, Pa., Boston, Mass., and Cleveland, Ohio, are considering the matter so it will be seen that it will be comparatively easy to fill the entry lists. Each city must declare by May 1 its intention to compete and must announce the make-up of its team by June 1. The complete rules, which will be essentially the regulations which have governed the Chicago Inter-Club team matches for the last ten years, will be framed by a committee headed by George F. Ballou, formerly of Chicago and now of New York. These will be ready by March 1, at which time entry blanks will be sent out.

Each city will be entitled to representation on the general committee, which will make the appointment and hold each representative responsible for the make-up of the team in his city. At the present time these representatives are: Chicago, S. E. Hibben; New York, Robert Lee Morrell; Indianapolis, Ind., H. H. Rice; Buffalo, N. Y., Dai H. Lewis; Detroit, W. S. Gilbreath. In all probability Harry W. Knights will look after the Boston, Mass., team, S. Boyer Davis, Philadelphia, Pa., and Fred H. Caley, Cleveland, Ohio.

### TAXI RATES BY YARD

Paris, France, Jan. 29—In consequence of the general increased cost of all commodities, Paris taxicab drivers have been given permission to raise their rates. With twenty-four hours of the police authority being issued practically all the taxicab companies had boosted their prices. These

increased charges are exceptional and are only for the length of the war. The initial charge of fifteen cents remains unchanged, but the distance carried for that amount has been decreased. Thus, instead of running a distance of 984 yards for fifteen cents, the meter now rings up an extra two cents at the end of 820 yards, then two cents more every 273 yards instead of every 328 yards, as formerly. Horse cabs increased their rates in the same way and in the same proportion.

### GERMAN TRUCKS CHANGED

New York, Feb. 17—Recent advises from Germany indicate the effect of the war has been marked in the design of German commercial vehicles. The trend has been toward American ideals of construction rather than the German, since German designs have been found too rigid for successful negotiation of rough roads; clearances were too low for new roads; and the vehicles were too heavy and their wheelbases often too long for a short enough turning radius.

The Germans recently have had an opportunity to study American design in the Yarrowdale, which the Germans captured. It contained American trucks consigned to the Allies. From their description as of the Bull-dog type it is inferred that they were Kelly-Springfields. They are being used in Berlin for carrying coal.

Hansa-Lloyd at Bremen now is producing a standard truck design which in both appearance and construction resembles American practice. These trucks are of 2-ton capacity, have shorter wheelbases, higher wheels and considerably more clearance.

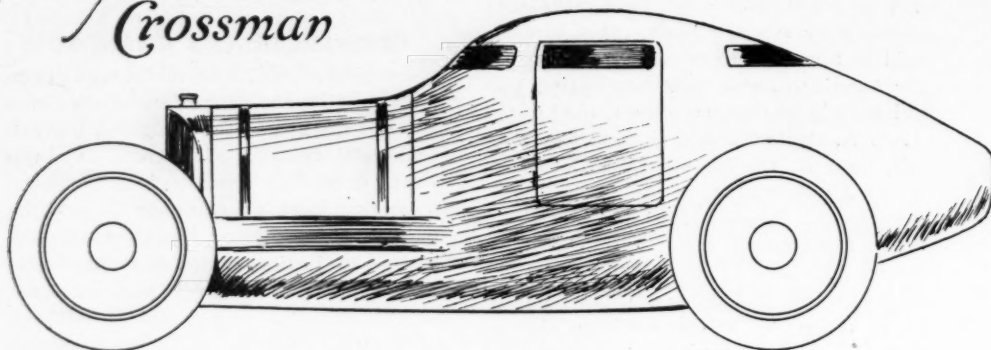
### EMPLOYEES TAKE 126 TIRES

Memphis, Tenn., Feb. 17—To lose \$2,500 worth of tires in several months without knowing it was the unusual experience of the 638 Tire & Vulcanizing Co. of this city. Five negro service chauffeurs employed by the company succeeded in taking 126 tires from the ship before being caught. The thefts were uncovered when detectives found some tires which they learned were stolen in the shop of a dealer in supplies. The make and serial numbers showed they came from the tire company's place and an investigation followed. Two grocers were arrested on the charge of receiving stolen goods, when it was learned that they had bought tires from the drivers and had resold them. Both denied knowing they were stolen. Later, the detectives, while working on the case, observed a car that had run into the curb. Investigating, they found one of the stolen tires on the wheel. The machine was a taxicab and the owner of the company was arrested.

The drivers, it is said by the detectives, operated on the order-first principle and did not steal any tires until they had found a market.

# Three Miles a Minute - and A Low Life Risk

by Edward C.  
Crossman



Barney Oldfield is to come back with much protective armor. For witness, see left

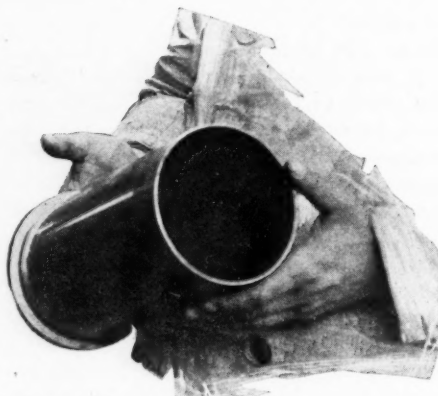
**P**OSSIBLY our esteemed fellow citizen James Jasper Jeffries couldn't come back—but they're not saying that about the ancient and honorable and original Barney Oldfield. As a matter of fact, he never was away. A new feature in racing cars serves merely to clamp his digits still more firmly to the present.

Barney bobs up with the announcement of a pair of racing cars adapted to cause the eyes of the rustic to stick out on his face like the optics of a crab. They'll pay four bits just to get in and gaze at the cars standing idly by the halter-rail.

The said pair of cars are different from anything under heaven and for once prove false the oft quoted remark of old Mormon Solomon about there being nothing new under the sun. Maybe the shade of a workshop doesn't count.

## Not a Soul to Be in Sight

Both members of the pair are to have an aluminum body completely inclosing driver and mechanic so the astonished spectator sees only a smooth-lined, submarine sort of a car without a human being in sight on, in or under it. The said body, making the car completely stream-line, clears the heads of driver and mechanic about 6 in. and is made of aluminum. Entrance into this "deep-sea craft" is by a little door at the side. Observation of the landscape is by means of slits in the front, sides and rear of the bullet-shaped body. The slits are covered with fine screen wire to discourage rocks and other little but hard things and to break up the air pressure that would otherwise tear down the celluloid windows behind. Forgot to mention the celluloid, did I? This is merely a long strip of flexible celluloid wound on rollers at either end of the forward slit, the rollers being so the driver can wind and rewind the celluloid and thus



This is one of the Vanadium iron cylinders for the big twelve-cylinder engine

clean it off automatically when it gets covered with oil or dirt.

The hero who pumps oil and gas and things and usually plays the role of sole survivor in case of catastrophe does not sit beside the driver as of yore, but 10 in. to the rear of the driver and to his right, thus making possible a narrower body and letting the driver hold communion with himself without the disturbing effect of a companion. This isn't all, either; here's some more of the story.

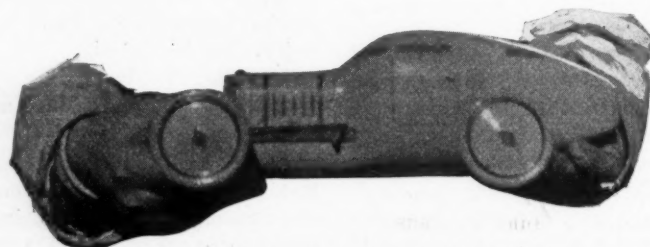
The exhaust does not stick out of the sides of the hood as in a racing car arranged according to Hoyle, but instead it is per-

sonally conducted to the rear through a pipe—a hollow pipe, of course—that runs through the inside of the body in a space-insulated with asbestos. The gases finally escape through an opening at the very tip-tail of the long tapered stern, giving a general effect of the California stink-bug, or pinacate, from which Barney got his idea. All this is to make the care stream-line, to keep old man air resistance from getting his fingers on anything along the smooth lines of the body. Even the axles are stream-line, being blade-form and arranged sharp end toward the front.

## Not a Fido, Though

Before regretfully dropping the subject of the body it may be well to assure the wondering public that though Barney does not contemplate making his car lie down and roll over and beg for biscuit just prior to each race and while he will endeavor within the limits of ordinary precaution to keep the four wheels of the car between it and the ground, yet if that car does insist on rolling over in the progress of a race, he feels that he'll enjoy it more if stored away in the submarine form of body than with his head sticking out and no form of shelter save the hollow mockery of the steering wheel.

The purpose of the inclosed body is merely to help guard against serious injury



The model of Oldfield's submarine type of racer is true to the racer's description



in case the car does turn over, and incidentally to cut down air resistance and to make the crew more comfortable at super-normal speed. The Hon. Barney assured us that at 120 m.p.h. the breeze thus engendered insists on shoving back one's head on one's spinal column in the play fashion followed by Charley Chaplin in abating the comic characters who are cast to play opposite him.

The car is to have double steering arms, so one arm, or the tie rod, may break without ditching the car or compelling it to make for the pits unless a part goes to resurfacing the road. This makes for safety, makes steering easier and probably lessens the danger from a burst front tire.

#### Two Are Being Built

While I have used the term car in the singular all the way, because the main points of both are alike, Barney is having two built, one a regular four-cylinder speedway car with 275 cu. in. displacement and 130 hp., the other a special made purely for breaking the Ormond straightaway record that now stands at 26 secs. for the mile. In this latter car Barney is going to install the airplane engine built for De Lloyd Thompson, the aviator, by Harry Miller, who also is building Barney's cars. This engine is twelve-cylinder, cast of solid aluminum, and weighs 600 lbs. for a 300 hp. generator, 5 by 6 in. This Barney is going to install in the straightaway, and with a car weighing around 1600 lbs. he expects to skim along the sandy beach like the festive sea gull, his hind wheels out of water most of the time.

The big engine, nearly finished, has some points of interest to the gas engine fancier. It will carry four magnetos on plates cast integral, and each cylinder will have a double spark from the two magnetos on its side. The cylinders are of very thin vanadium iron. The camshaft drives at both ends to obviate the twisting effect of the one-end driven shaft with a long engine.

#### Barney Expects 180 m.p.h.

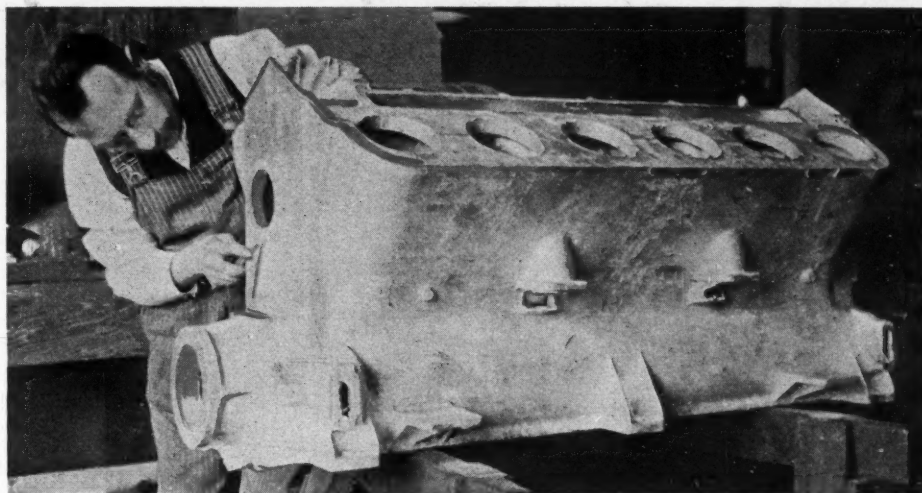
The drive on this 3-mile-a-minute car will be straight through without any transmission or idle shafts to go whirling around and around. It will be stepped down to about  $1\frac{1}{2}$  to 1 in the rear end.

This is the car that Barney thinks will make 180 m.p.h. There is to his mind only one but, and that is, he may not be able to get sufficient traction with the powerful engine and the light car. Only, the resourceful Barney will not be entirely stumped even then.

"If deflecting planes will drive the airplane up and down according to their angle," said Barney, "why won't a deflecting plane on a car going more than 100 m.p.h. help drive it down to the ground and add weight and aid in the traction, huh?"

An echo answers "Huh?" because motor car history shows no record of its having been tried.

The other car, which will be used for



He is putting the finishing touches on the twelve V-shape engine

ordinary track work, is to weigh 1600 lbs., to have 104-in. wheelbase and to have a special Miller aluminum engine, cast solid, with the pistons and connecting rods inserted and removed from the bottom. It is to be  $3\frac{3}{8}$  by 7 and develop, as before stated, about 130 hp.

This car also is to be so fast that Barney will have to tow an anchor on a curved track to keep from running over into the next county. Barney's big Delage is now being rebuilt to serve as practice car in feeling out the hog-wallows and 'thanky-ma'ams of a course, saving the new pet for the real purse-grabbing stuff.

The cars are to have the Miller carbureter, used by Resta, Atkin and others who insist on finishing up in the first few persons to end the races and British K L G spark plugs.

All the foregoing is not the idle chatter of a dreaming motor car driver nor yet the spoutings of the imaginative press agent. The engines are nearly finished, and the chassis of each car was being assembled

in the early part of February. I have seen them with my own eyes.

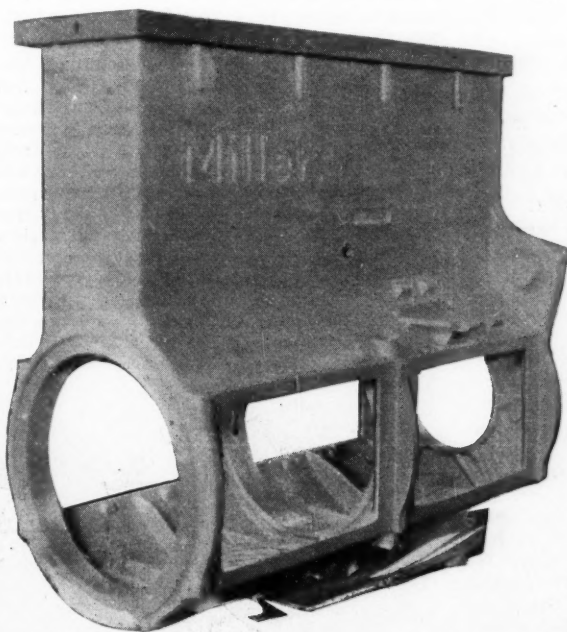
Only Bill Pickens went too far when he insisted that Barney—being suspected of German descent—would guide his car by means of a periscope, nor will Harry Miller, even to please Bill, fit out the cars with a dummy periscope for the edification of the proletariat. A vision of the sort would make a French Peugeot jump clear off the racetrack.

#### NEW ROAD BUILDER TRUCK

New York, Feb. 16—A brand new model of a 6-ton truck called the Road Builder has just been brought out by the Garford Motor Truck Co., Lima, Ohio. It is a vehicle built especially for road construction work, and while it still retains the characteristic Garford steel Roman dash with the engine between the seats and final chain drive, it differs from all previous Garford trucks in that it has a worm-driven jackshaft in order to obtain a large gear reduction between the engine and the rear wheels.

It has a short wheelbase of 128 in.; steel wheels of West manufacture, both front and rear, the former 40 by 10 and the latter 48 by 20; a steel dump body and a new type of Wood hydraulic hoist. The engine is  $5\frac{1}{8}$  by  $5\frac{1}{2}$ , with an N. A. C. C. hp. of 41.61 and the valves placed opposite.

The truck has a total carrying capacity of 20 tons, the weight above the 6-ton load of the truck itself being carried in several four-wheeled trailers. A special double-spring drawbar is provided for connecting the trailers and an additional crosswise drawbar with seven attachment points for scarifiers, scrapers, etc. The truck was first exhibited to the public at the Good Roads show which was held at Boston, Mass., recently.



The 16-valve, four-cylinder engine will occupy the speedway car

# Cork Proposed as Clutch Facing

## Use of Insert Material as Entire Friction Surface Under Test—Manufacture of Cork Products

INDIANAPOLIS, Ind., Feb. 17—There is a possibility of using complete clutch facings of cork for both disk and cone clutches, instead of employing the corks simply as inserts. Recent tests in the laboratory and in actual road work seem to show that special compositions of cork in the form of disks and sheets may be made to replace leather and fabricated clutch facings and offer improvement in operation of the clutch.

This announcement was made by Engineer Young of the Armstrong Cork Co. during the discussion of a paper on the production of cork and manufacture of cork products delivered last night before the Indiana section of the Society of Automotive Engineers by H. W. Prentis, Jr., manager of the publicity department of the Armstrong company. The manufacture of cork clutch inserts, carbureter floats, gaskets, etc., was explained and illustrated by slides, and the making of linoleum such as used for running boards was illustrated by moving pictures.

### Cork Clutch Facings

The real feature of the meeting was the announcement of cork clutch facings. Mr. Young stated that these have been under test for several months and so far had not shown signs of failure. He said that though the coefficient of friction of cork varied greatly in grade and treatment, it was so much better than common friction materials that it permitted the transmission without slippage of much power and at the same time produced a clutch that was very soft in action.

One interesting feature brought to light by the experiments is that in using the cork sheet as a lining for a cone clutch, it is necessary to increase the angle of the cone from the usual 12 deg. to about 16 deg. Otherwise, the clutch would refuse to release. Extracts of Mr. Prentis' paper appear below.

### What Cork Is

CORK is the outer bark of the cork oak, a tree which flourishes in the Spanish Peninsula, Southern France, Italy and Northern Africa. Of the various countries, Portugal is the leader in cork production. Spain is a close second and Algeria ranks third.

The heavy coating of outer bark is removed every 8 or 9 years. So long as the delicate inner skin is not harmed, this process seems to further rather than retard the growth of the tree. The process is simple. They cut through the outer bark carefully, following the deepest of the natural indentations, and then pry it off in large sections by inserting the long wedge-shaped handles of their hatchets.

Not only the trunks but the larger branches are stripped, the latter yielding the better bark. Care must be taken not to injure the inner skin of the tree at any stage of this process, for the life of the tree depends on its proper preservation; and if it is injured at any point, growth there ceases and the spot remains forever after scarred and uncovered.

The trees are stripped, as a rule, for the first time when they have attained a diameter of about 5 in., which they usually do by the time they are 25 years old. The first



Clutch inserts—A rapidly-rotating tubular punch ejects these corks

stripping is known as "virgin" cork. It is so rough and coarse in texture that it is of comparatively little commercial value. The tree at once sets about forming a new coating which, at the expiration of 8 or 10 years, is also removed. It is known as second stripping bark. As a rule the second stripping cork is of fair quality, but owing to the large number of indentations, there is a great deal of waste involved in cutting it up.

But with the third stripping of bark, which follows in about 9 years, the tree begins to yield its best bark, continuing productive, as a rule, for a century or more. Cork trees several hundred years old, however, are not unknown.

After the bark is removed from the tree it is gathered in piles in the forest and allowed to season for a few days. The thickness of the bark is anywhere from  $\frac{1}{2}$  to  $2\frac{1}{2}$  in., while the yield also varies greatly—from 50 to 500 lbs.—depending on the size and age of the tree. The bark is next roughly baled up and carried, either on the backs of burros or in wagons, to the nearest boiling station. Here it is boiled in large vats to render it soft and pliable and to flatten it out for convenient packing. After boiling the rough, woody part can be easily scraped off, reducing the weight of the material almost 20 per cent.

Loaded on the backs of burros, or some-

times in wagons, if the roads are good, the cork is then carried to the nearest railway station for transportation to the cork manufacturing and distributing centers. The long trains of burros—thirty, forty or even 100—present a most grotesque appearance, each animal loaded from head to hindquarters with a huge mass of the light bark.

Arrived at the factory, the cork first goes to the trimmers, who cut off the rough, undesirable portions. It is then sorted into a dozen or more grades, according to quality and thickness. The importance of this last mentioned operation cannot be over-emphasized, as the whole problem of the successful and economical manufacture of cork centers about it.

When the cork is re-baled for shipment to America, broad sheets are laid in the baling box to form the bottom of the bale. Above them are placed smaller pieces, which in turn are covered with larger sections. The whole mass is then subjected to pressure to render it compact, afterward being bound up securely with steel hoops or wire. The average bale weighs 200 pounds.

For whatever purpose it is to be used, all bark removed from the immense storage rooms of the American plants is taken first to the sorting department, where, under skilled eyes, the twenty-five or more foreign grades are re-sorted into approximately 150 different classes, according to quality and thickness.

The corkwood is then softened by placing it in a warm vapor bath. Then by means of a circular steel knife, making hundreds of revolutions every minute and kept at razorlike sharpness, the sheets are cut into strips whose width is determined by the length of the cork desired.

From the slicer, the strips pass to the blocking machines, where by the operation of a rapidly rotating tubular punch, cylindrical pieces are bored out and released with almost incredible speed.

### Machines Taper Cork

The stoppers which come from these machines are round, with parallel sides. If tapered corks are desired, larger at the upper end than at the bottom, the cylindrical or straight pieces must be passed through other machines.

A host of other useful articles also find their way from the many manufacturing departments to the shipping-room. Of insoles—from 15,000 to 20,000 pairs are produced daily. Disks and washers by the million are punched out for use in metal caps for bottles and jars and as gaskets in lubricator cups. Life-preservers, ring buoys, yacht fenders and mooring and anchoring buoys are the



Special shapes for carbureter floats



specialties for one department. Another pays particular attention to the manufacture of seine and gill corks, and bobbars for fishing lines. So varied, in fact, are the forms which cork assumes, that the complete cataloging of the functions which it fills would be wellnigh impossible. The finest pieces of bark are made into cork paper, so thin that 350 sheets measure but 1 in. in thickness. Sorted into several different grades, this beautiful velvety material is practically all used in making cigarette tips.

While natural cork is used for these purposes extensively, as you will see, experience has shown that a cork composition is much more suitable in many instances. The composition that has been developed at Pittsburgh is the result of several years' effort to produce a satisfactory material for use where the temperature does not exceed 212 F. Gaskets made of this composition are not affected by oil, gasoline, grease or water, and may be kept in contact with any of these liquids without disintegration during service.

Not only is the original elasticity of the cork retained in these gaskets, but the process of manufacture tends to increase it. This characteristic makes them especially suitable for use between rough or uneven surfaces and, hence, where cork gaskets are employed it is not necessary to use machine pressed steel parts or castings. As was mentioned before, these gaskets do not harden with age, but remain elastic. This composition is of itself liquid-proof and will not become saturated. It is unnecessary, therefore, to put excessive pressure on the gaskets to insure tight joints. Oil leakage has long been a source of expense and annoyance to the motor car owner and purchasers are now demanding oil-tight joints. Because of their permanent elasticity and imperviousness to liquids, cork gaskets offer the cheapest efficient solution of this problem, especially where pressed steel pans and covers are used.

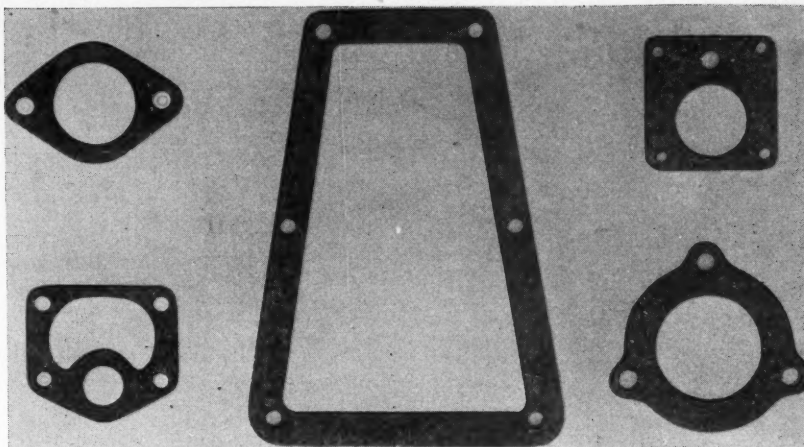
#### Cork Gaskets Solve Rattling

The constant resistance of cork gaskets to pressure develops a condition similar to the lock washer in keeping bolts tight. Consequently motor cars equipped with these gaskets are free from rattling due to loose bolts, so common after a car has been run a few hundred miles.

Since smooth surfaces and excessive pressure are not required to secure tight joints with cork composition gaskets, fewer bolts and bolt holes are necessary. This not only increases the strength of the metal parts, but decreases the amount of machine and assembling work necessary. In many cases the savings effected in this way will practically offset the cost of the gaskets.

Cork gaskets have given excellent results between crank case and oil pan. Such gaskets should ordinarily be thick enough to make a good fill between bolt holes with moderate compression. Added pressure may be applied if desired, as the cork will squeeze to the thickness of thin paper around the bolts. Any spring in the metal will be taken up by the elasticity of the cork, insuring tight joints.

Boiling water or steam, if kept in contact



Gaskets are made from finely ground cork and a binder

with the flat face of a cork gasket, would, in time, cause damage. If, however, the gaskets are held under pressure between metal surfaces, they may be safely used where the temperature rises to that of boiling water or slightly higher. A number of builders are successfully preventing hot water leakage by using cork gaskets between the top and bottom plates in assembled radiators on motor trucks, and also between pressed steel water outlet and inlet manifolds, baffle plates and motor head stampings. The gaskets readily conform to the irregularities in the castings and pressed steel surfaces, insuring permanently watertight joints.

Many prominent motor car builders have been using gaskets of cork composition in a number of other places. Some of the more general applications are on cover plates for timing gears, valve compartments, transmissions, oil pumps and accessories to crankcase, clutch and flywheel handhole covers, carburetor intake manifolds, differentials, etc.

Cork gaskets are easily applied with a thin coating of waterproof cement, or shellac, spread over one of the contact surfaces. Care should be taken not to use too much cement, as otherwise it might squeeze through the bolt holes, causing the gasket to stick on both sides when assembled. The gasket should be weighted down until the cement is thoroughly dry before assembling the parts.

Washers of cork composition have the same characteristics and are used extensively to prevent rattling and the entrance of dust. They are also used in connection with stuffing boxes where the shaft speed is not high enough to generate heat much above that of boiling water. Not only do they protect the bearings against dust, but they stop oil and grease leakage.

Floats for carburetors, oil gages and gasoline gages are invariably made of natural cork rather than composition. These are produced in several styles to conform to individual specifications. Experience has shown that floats should be coated with a material similar to shellac to give the best results.

Natural cork clutch inserts are supplied in

four grades. Natural cork washers for various purposes and natural cork plugs for wire conduits, spark plug holes, etc., are also furnished.

#### NO BOAT TRIP THIS YEAR

Chicago, Feb. 16—The Society of Automobile Engineers will not take a boat trip during the mid-summer meeting this year as has been the custom for the last two years. The society has been enlarged by consolidation with other engineering bodies, such as aviation, tractors and marine motoring, and the lake steamers cannot give adequate accommodations for the increased membership. The place of the summer session has not been selected, but a definite announcement is expected soon.

The winter meeting of the society may be held next year in Chicago. Show week in New York is so crowded with banquets and other functions that it has been suggested that the transfer be made to Chicago. Chicago hotels have accommodations for banquets with 800 in attendance, practically the same as New York. The regular January meeting was held in Chicago Feb. 1, and at this meeting the entire draft of the Standards Committee was approved and announced.

#### TO CONSULT MAKERS AND USERS

Washington, D. C., Feb. 16—Both makers and users will be consulted by the Government before standardization of screw thread tolerances, it seems. A bill has been introduced in Congress to provide for a commission to standardize the screw thread tolerance so that the War Department and other departments which purchase machinery would make the same demands in this respect. A hearing was held recently at which among those invited was the Society of Automotive Engineers, who could give information about the S.A.E. fine pitch threads established in 1906. It is the belief of Dr. Stratton, director of the Bureau of Standards, that it will be possible for the industry and the Government to agree on a practice both can follow.



Cork shapes cut from the bark are called natural cork—others are composition of cork particles and special binder

## Packard Selling Race

Trade Sweepstakes Will Start  
on Washington's Birth-  
day at Factory

Sales to Be Listed on Lincoln  
Highway Map

DETROIT, Feb. 20—At 11 a. m. this morning 111 Packard dealers and their employes opened sealed orders telling them of a selling sweepstakes race starting Washington's Birthday at noon. The dealers have been divided into four classes, and each class runs an independent race, which will last until 2500 cars are sold. The 2500 cars have been divided into allotments graduated in size, depending on the number of cars sold so far this selling season. The selling season for the Packard company starts in August, and hence the number is based on past records from August to date.

When the race closes the dealer in each class who has sold the highest percentage of his allotment wins and will receive a prize. Of the dealers 110 are in the United States and one in Honolulu. The score is to be kept on boards carrying a map of the Lincoln highway. The distance across the continent is divided into 100 spaces, each space representing 1 per cent of quota. The racers start at San Francisco and when they have reached New York 100 per cent of quota has been sold. For those who exceed 100 per cent quota imaginary vessels will bear them out to sea on the scoreboard.

The race involves more than 800 salesmen and is expected to extend to every man in the organization in one form or other. Its purpose is a test of the Packard sales organization and to measure its efficiency in merchandising. A program will be given at the Packard factory Washington's Birthday, and President McAuley will start the race by pushing a button. It is expected that there will be contests between salesmen in each organization.

### ATLANTA SPACE IN DEMAND

Atlanta, Ga., Feb. 20—Special telegram—With every inch of available space already contracted for and many new exhibitors clamoring for booths the Southeastern Automobile Show will open here Saturday, Feb. 24, to continue for eight days at the Auditorium Building. The display will cover 28,000 sq. ft.

### STUTZ PROFITS MOUNT

Indianapolis, Ind., Feb. 16—Net profits of \$649,042 for the year ended Dec. 31, 1916, are reported by the Stutz Motor Co., this city. These are equal to \$8.65 a share on the 75,000 shares of stock, no par value, of the parent company, the Stutz Motor

Car Co. of America, which took over the local company last June.

The income account for the 7 months ended Dec. 31, shows net profits for the period of \$381,061, equivalent to \$5.08 a share. In that period \$1,771,328 in cars were sold. During the whole year the company produced 1535 cars, an increase of 42 per cent over 1915. The entire expected maximum output of cars for 1917 has been contracted for.

### WIDENING RIVER FOR FORD

Detroit, Feb. 16 — Appropriation for making the River Rouge navigable to the Henry Ford blast furnaces will come before the senate committee next week. Contingent on this appropriation are contracts of approximately \$12,000,000. If the appropriation does not go through, it will be impossible to get ore to the gigantic industry planned by the Ford Motor Co. The project for making the Rouge navigable for the largest lake boats from its mouth to the Ford furnaces appropriation is possible in the opinion of those in charge of the lake survey.

### DOBLE DISTRIBUTORS ANNOUNCED

Detroit, Feb. 17—The General Engineering Co., this city, maker of the Doble steam car, has appointed the Pacific Kissel Kar Co., San Francisco, Cal., distributor of the Doble on the Pacific Coast and the E. C. Thompson Co., Minneapolis, Minn., distributor in the central northwest. The San Francisco company has been allotted the states of California, Oregon, Washington, Nevada, Arizona and Hawaii. The Thompson company will have Minnesota, the western half of Wisconsin, North and South Dakota and all Montana east of the Rockies.

### TRUCK BUSINESS DOUBLED

Detroit, Feb. 19—The Detroit-Wyandotte Motor Truck Co. held its annual meeting last week and announced that the volume of business handled by the company in 1916 was approximately double that of the year preceding. The financial statement shows a net surplus of \$80,438.99 at the end of the year. The following officers were re-elected: President and general manager, George A. Horner; vice-president, D. Rasch; secretary and treasurer, Milo O. Crawford.

### MAY MAKE WAR BALLOONS

Akron, Ohio, Feb. 19—The B. F. Goodrich Co. and the Goodyear Tire & Rubber Co. are preparing bids for the manufacture of several hundred airships of the non-rigid Blimp type, to be used by the Federal Government for scout duty along the coast. These air devices will be about 150 ft. long and of cigar shape, resembling somewhat the zeppelin with the expansion of the power equipment and general construction.

## Dodge to Build Truck

Proposed Light Delivery Car  
May Not Exceed 1000  
Pounds

Design Will Be Tested Thoroughly  
Before Its Production

DETROIT, Feb. 16—Dodge Bros. will bring out a small truck. Reports have been circulated that the Dodge company already has brought out a commercial vehicle. These reports are untrue, though the Dodge company has under consideration the manufacture of a light delivery car which will probably not exceed 1000-lb. capacity.

An official of the Dodge company explained that there had been urgent requests from the dealers for a small truck, and it is to meet this demand that preliminary designs for a small unit are now being formulated. Before the truck is actually built, however, a few will be made up and given an exhaustive road test so that when the design is perfected, production will be uninterrupted by errors which might have occurred due to haste.

The Dodge company has discouraged the overloading of their chassis with truck bodies that are too heavy, but to meet the requirements where it has been absolutely necessary, a few chassis have been furnished which are the same as the stock passenger cars except for oversized tires, heavier springs and a special form of shroud which is flush with the windshield.

### REDDEN IN BIG PRODUCTION

Chicago, Feb. 16—Quantity production of the Redden Truck-Maker, backed by \$4,000,000 capital, is the basis of the big merchandising plan of the Redden Truck Co., which has just completed its organization. A coterie of Chicago and New York banking and manufacturing interests have arranged to re-finance the company and place it in a position to make the truck-converting attachments complete in plants that will be allied with the Redden company.

Twenty branch assembly plants in twenty of the largest cities in the country are part of the manufacturing and merchandising plan of the company. The main factory of the enterprise will be located either at Joliet, Ill., Jackson, Mich., or Chicago, where those people interested already have large manufacturing interests. Subsidiary plants will be operated after the plan of the Ford Motor Co.

Prominent in the organization of the Redden company are the following: Horace DeLisser of the Ajax Rubber Co.; H. W. Cowan, capitalist and former associate of F. W. Woolworth; C. A. Bickett, president of the Chicago Bearing Metal Co.; L. B. Patterson, Chicago banker; and W. K. Pritchitt, of the New York banking house, Pritchitt & Co.



# CO-OPERATION OF MAKERS URGED

## WOULD HAVE ENGINEERING IDEAS IN TRACTORS RESULT OF COMBINED EFFORT

KANSAS CITY, Mo., Feb. 15—Coöperation among manufacturers of explosive engine-driven tractors, a laying upon the table of one man's engineering discoveries for the use of the other fellow, will very likely become a realization. It will mean for America and for Europe what the motor car business means now. The engineering ideas embodied in every tractor will be the results of combined effort, not the builded idea of an individual. The initial promulgation of this movement came in a memorable gathering of members of the Society of Automotive Engineers, of the Society of Tractor Engineers, and tractor builders, dealers and progressive business men of this section, held at the Hotel Baltimore last night.

### Too Many Designs

Fred Glover, vice-president of the Emerson-Brantingham Co., who acted as toast-master, brought out forcefully that there was now too much diversity of design in the tractors on the market. In comparing the possibilities in standardization he cited how the S.A.E. had brought about the similarity and consequent perfection in motor cars by the coöperation of the engineers.

Present at the meeting was George W. Dunham, president of the S.A.E. In his address Dunham made vigorous plea for coöperation along the lines followed by the society of which he is head, coöperation between the tractor engineers and the members of the S.A.E. Following this idea

### KANSAS CITY MEETING

Coker F. Clarkson, secretary and general manager of the S.A.E., cited the example of the recent affiliation with the S.A.E. by the prominent airplane engineers of the country. This industry, really no older than tractor building, is already standardizing, coöperating and resultantly generally bettering its product.

The tractor is to the horse as the horse is to the ox in the eyes of Hugh McVey of the Capper publications, Topeka, Kan., one of the speakers. Through a series of marked maps McVey pointed out the field for tractor sale, the states of the Middle Southwest and Northwest. He explained that the Eastern tractor market had developed more quickly because the lack of farm labor demanded it, but that that condition had now swept to the West and its only solution was tractors.

It was brought out in the meeting that the tractor will permit of enormous increase in crop production in Kansas because of its ability to do the plowing at the time it should be done. Horse-equipped farms are handicapped because of the fact that, for the sake of humane consideration of the horses, the plowing cannot be done in extremely hot weather. A pitiable example of this is found in the present crop condition.

The heat of last summer, at the time when plowing should have been done, was such that horses could not be used. To

this discrepancy is attributed the fact that Kansas will probably lose several million dollars in planted ground which must be plowed up. Present indications point to a complete loss on over 2,000,000 acres of planted ground. It is claimed that this loss could have been almost totally avoided had tractors been used to do the plowing at the proper time, which was during the terrific heat spell.

### Relation to Food Supply

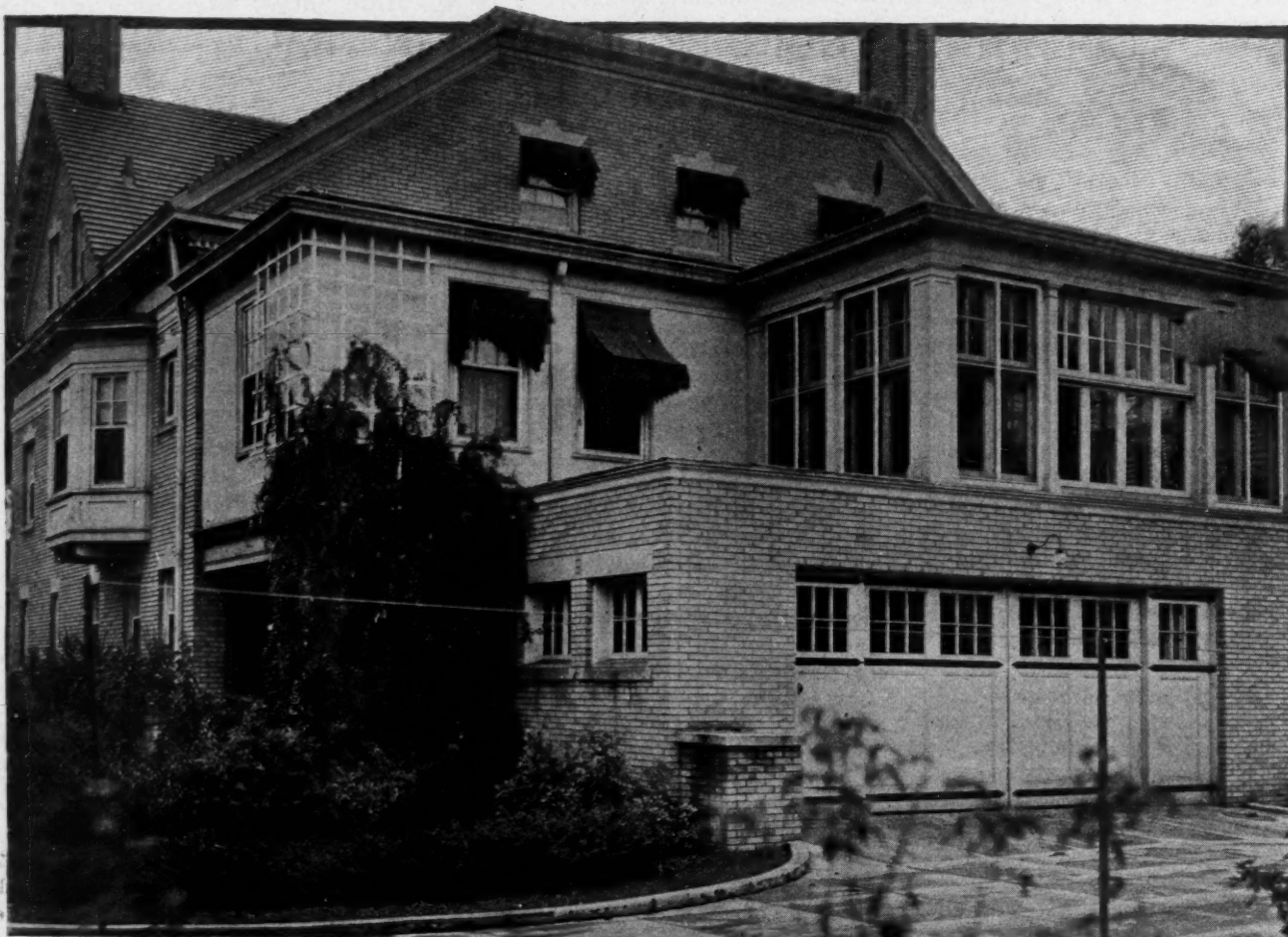
C. M. Eason of the Hyatt Roller Bearing Co. spoke of the value of the tractor industry in increasing the food supply. It is his opinion that intensified farming is the only solution for the present scarcity of food and consequent high prices. He brought the point home with the statement that the population of the country had increased 26,000,000 since 1900 and that there was only a very slight advance in the amount of corn and wheat production and a decrease in meat output of 25 lb. per capita. The tractor is the proper medium for intensified farming.

H. L. Horning of the Waukesha Motor Co. made an argument for tractor standardization with the statement that the engineering value of coöperation and consequent standardization is to eliminate the unnecessary thrust upon the industry by individuals. He said the matter of working individually in engineering lines was blind, ancient hyprocrisy, that the engineers were like hogs in a trough in following such a trade.



Tractor dinner of Society of Automotive Engineers at Hotel Baltimore, Kansas City

## Making the Garage Domestic



*There are ways and ways of making the garage other than foreign to the house, and this is one of them. It is large enough to turn a car completely around in on its own power, has an overhead washing outfit, and a billiard room occupies the space above. Its general plan follows that of the side porch and harmonizes throughout with the rest of the house*



*Here are good examples of the opportunity to provide sleeping porches and an instance in which the roof design has made the approach to the garage natural and pleasing*







*This garage for two cars forms an apparently necessary part of the house. Vines add to its arrangement. At the lower right plenty of space lets the garage be a separate unit of the house*



*The good design of the doors above more than compensates for any fear the owner may have had before making the garage domestic, while the door in the rear side of the house to the left might lead anywhere else but to the garage to which it does lead*



# LOUISVILLE AS A USER

## RANKS WITH LEADERS AS MOTOR CAR CITY, IN USE AND DISTRIBUTION

LOUISVILLE, Ky., Feb. 16—Louisville's annual show is the largest to hold attention south of the Ohio river and marks the opening of the selling season in this section of the country. The territory covered by the local agents, factory representatives and branches, as a rule, includes southern Indiana, the entire state of Kentucky and in some instances Tennessee, the western portions of West Virginia and Virginia.

In Louisville sixty-six different makes of cars are handled by fifty-one dealers and distributors. A number of the largest factories and tire concerns in the United States maintain branches here.

### Distribution Facilities of Best

Louisville is a motor car city, not in the producing sense, but from the standpoint of use and distribution. As a distributing point, with its excellent railroad and river facilities, it ranks with the leaders.

Business is far better than it was at this time last year. A conservative estimate, based on interview with dealers, shows an increase of about 50 per cent so far this year over the same period in 1916. A few agents declare business is 75 per cent better, but this is the exception rather than the rule.

The majority of the dealers have a larger list of live prospects, who have promised to sign up in the spring, than ever before. The lack of deliveries is the principal complaint Kentucky dealers have to make against the factories.

Here in the Bluegrass State the truck is fast coming into its own. Never were business men so interested in the commercial car. The motor car in Kentucky experienced its most prosperous year in 1916. The actual increase in registration was 12,000 for the year.

"If 10 per cent of the cars registered in 1915 were consigned to the junk pile or taken outside of the state the sales of new cars reached the total of 14,000, or an increase of 71 per cent," says Hugh Ramsey, deputy commissioner of motor vehicles, who is an authority on the Kentucky motor vehicle situation.

### Most New Cars Low Priced

Of these 14,000 new cars about 80 per cent were cars priced under \$1,000, many of them under \$500. The 20 per cent represented by the higher-priced cars will bring the average price to about \$700 per car, or about \$10,000,000 worth of new cars were purchased in the state in 1916. The total state registration for 1916 was 31,500 cars and 1590 motorcycles, which paid \$181,174.94 in fees. The entire receipts are turned over to the state road fund, less the

### Show Opens Season

expenses of the department. This adds about one-third to the collections from the state road tax of 5 cents per \$100, all of which is distributed to the counties by the state highway department.

This is every indication that the collections for 1917 will run to \$275,000, as the same proportion of increase would give a total of 50,000 cars. Receipts will be greater this year than heretofore for the same number of cars.

### How Use Has Grown

To give an idea of the growth of the motor car in Kentucky, the car and truck registrations by years since 1911 are given herewith:

1911	2,868	1914	11,746
1912	5,147	1915	19,500
1913	7,210	1916	31,500

A tabulation of the licenses issued during three months of 1916, when practically all the registrations applied to new cars, show that the six best sellers had as a leader a car selling under \$500, which was registering 57 per cent of the total number. Number two was a car selling at about \$700, with 5½ per cent. Number three sold at about \$600, with 4 per cent. Number four sold at near \$1,000, with 3¾ per cent. Number five was at about \$500, with 2½ per cent, while number six sold at about \$800, with 2 per cent.

This shows that the increase has been largely the small car, and it has gone not only into the country, but the cities have taken their proportion. The sale of a small car this year means the sale of a bigger one next. In the autumn of 1915 six men came from Henry county to Frankfort together to get licenses for their new cars of a small type. In 1916 four of these men returned together for license for as many large cars. This is a general tendency.

### Large Exporting Center

The estimated population of metropolitan Louisville today is 325,000; within a 20-mile radius, 400,000. The city is the largest exporting center in the world for tobacco and whiskies. It is the largest grain market in the country outside of Chicago, as well as the largest livestock market. Louisville also is the principal mahogany market and manufacturing center in America. Other great industries here are: Agricultural implements, porcelain-lined bath tubs, paints, varnishes, cement, chewing gum, cottonseed oil, cottonseed oil products, organs, hardware, boxes, barrels, stoves, millinery, window shades and loose-leaf ledger supplies.

Louisville's trade rounded out the year 1916 in better condition than for many years. Many manufacturers and jobbers reported the best business in their history with good prospects for the New Year. Increases of 25 to 50 per cent in the volume of business as compared with 1915 were common. Holiday trade ran from 40 to 50 per cent ahead of a year ago. Totalling nearly \$1,000,000,000, an increase approximately of \$200,000,000 over 1915, the previous best mark, bank clearings in Louisville for the last year reached the highest figure in the city's history.

The exact amount was \$942,143,136, while that of the preceding year was \$742,391,281. Increased volume of local business, reflecting also the marked revival in trade and industry in the state and the South, formed the bulk of the increase, though to some extent the rise is traceable to the fact that country bank exchanges, which are now cleared in Louisville, were greater last year than usual.

With the exception of 1914, when there was a decrease of nearly \$50,000,000, Louisville clearings have steadily increased since 1908, the year following the panic. Louisville's progress has been rapid and substantial, and today the city's exchanges are in greater volume than a number of other cities of equal size or larger, including Indianapolis, Buffalo, St. Paul, Seattle, Denver, Providence, Columbus and Toledo.

### Ratio of Cars

Kentucky, with a gross area of 40,598 square miles, had a population of 2,386,866 on Jan. 1, 1917, according to the census bureau's estimate. There is only one motor car for every seventy-five persons in the Bluegrass State today, which indicates what immense possibilities Kentucky holds for the sales organizations of the factories. Then, too, there is a good foundation in this territory for future business. The principal crops of Kentucky in 1916 possessed a farm value of approximately \$187,531,590, an increase of \$58,267,000 over 1915. An increase of more than \$4,000,000 in whisky tax during the calendar year 1916 over the preceding year brought the grand total of internal revenue collections for the same period to a new record in the Fifth district of Kentucky.

Whisky collections advanced from \$14,872,725.08 in 1915 to \$18,017,028.51 in 1916, an increase of \$4,144,303.43. The grand total of internal revenue collections in the district for 1915 was \$18,813,676.74, and for 1916 \$22,380,498.05, an increase of \$3,566,821.41. Whisky brought in all of this grand total for 1916 except \$4,363,469.54.



It is estimated that over \$60,000,000 has been spent in distillery and brewing property in this state. It is further estimated that the operating capital of Kentucky distilleries aggregates something like \$125,000,000. These figures to some extent give an idea of the importance of liquor making in a state famous from its earliest days for this industry.

Leaf tobacco is bringing the highest prices in more than ten years, due to the widespread and pronounced prosperity and the great European war.

According to the United States Department of Agriculture, the state of Kentucky in 1916 raised 435,600,000 lbs. of tobacco, which had an average farm value on December 1 of 12.7 cents a lb., or a total value of \$55,321,200. The crop of 1915 was estimated at 356,400,000 lbs., and the average farm value on Dec. 1, 1915, was 7.8 cents a lb., making the total value of the crop \$27,889,200. Thus it may be seen that the crop of 1916, although only 79,200,000 lbs. larger than that of 1915, had a value twice as great.

The corn crop was worth \$82,824,000, as compared with \$58,000,000 for 1915. Besides the supply of livestock and its value and minor farm products rank far above those of 1915. Thus it may be seen that this territory is in possession of a tremendous buying power, and its business pursuits are less susceptible to the effects of the great war than those of many parts of the country.

#### NASHVILLE SHOW A SUCCESS

Nashville, Tenn., Feb. 19—With an attendance of more than 30,000, a large proportion of whom were live prospects, the Nashville show, which was opened Feb. 12 and closed to-night, was the most successful held by Nashville dealers. Twenty-two dealers had displays, showing twenty-eight makes, in addition to accessory concerns. The show was held in the Hippodrome, one of the largest buildings of the kind in the South. The building was elaborately decorated, the national colors predominating. Owing to the car shortage none of the dealers was enabled to make a special display, and in some instances they were compelled to use borrowed cars.

Greater interest in the cars was shown this year than ever before, according to leading dealers, and the number and character of inquiries received indicate a record-breaking spring business. Practically every dealer in middle Tennessee and many from southern Kentucky and northern Alabama were on hand and several agencies were placed by distributors. Special preference is indicated for closed cars, due to the desire for all-year motoring.

A number of unusual features were arranged, among them being Patriotic Night, when all cars were decorated with flags and a "dove of peace" was liberated, a prize being offered for the person capturing it.

## SHOW IS A THOROUGHbred TWELFTH ANNUAL EXHIBITION IS HELD IN ATMOSPHERE PECULIAR TO KENTUCKY

LOUISVILLE, Ky., Feb. 17 — Louisville's motor show has come around with all the polish and finish so long a matter of legend in regard to the famous Kentucky horse shows. Though not the largest show, it possesses a certain quality that even the national shows do not have. It is the twelfth annual show and is held in the Jefferson County Armory, a one-story building with 55,000 sq. ft. of uninterrupted floor space. While held under the auspices of the Louisville Automobile Dealers' Association, local dealers not members were permitted to exhibit.

The total of cars displayed is 167. Forty-seven makers are shown; thirty-one gasoline cars; three electric cars; and thirteen gasoline trucks. There are a dozen or more accessory exhibits by local dealers.

Fourteen-foot pillars mark the aisles between the exhibits, and growing plants are placed on the low fence posts, which are part of the general scheme to make each exhibit individual. The decorations as a whole are electrical. Festoons of evergreen draped from the center of the high ceiling to the balconies carry many electric lights.

The show is a selling show. Many of the visitors have arrangements whereby they are notified when the prospect, to whom they have sent admission invitations beforehand, arrives and are ready to receive them by the time they are fairly in the building. The show was a success financially before the doors opened even. The balance last Monday was \$3,000, and the rebates to dealers will leave a balance in the treasury, which is used to improve highways and streets and so on.

#### HARTFORD HAS BIGGER SHOW.

Hartford, Conn., Feb. 17—The show, which closed here to-day, had more cars than ever and was successful from a business standpoint. Sixty-one gasoline cars were displayed, besides four electric cars and one steam. Fourteen makes of trucks were among the exhibits. The decorations were very simple, and the show committee apparently had aimed to make the cars the main points of attraction. Quite a little interest was due to the use of the armory for the show. Even when the show first opened there was some fear that the state forces might require the building. Militiamen patrolled the armory day and night, and no one was permitted below the main floor.

All space was occupied. Even the company rooms at the side were filled. More closed cars than ever were exhibited.

The Ford dealers selected show time to sell cars on installment, one half down and

the balance at \$10 a week. One of the city banks financed the plan.

#### MILWAUKEE SPRING SHOW

Milwaukee, Wis., Feb. 16—Milwaukee dealers again will hold a spring show late in April. This year, as before, the show will take the form of a circuit-exposition in which each member holds a special display in his salesrooms at the same time, visitors being transported from one salesroom to another free of charge by a squadron of demonstrators furnished by each exhibitor.

The third annual fall show, with the Wisconsin State Fair in West Allis, a suburb of Milwaukee, will be held Sept. 9-15. An exclusive lease has been obtained on Machinery hall, now Motor hall, which permits an exposition of almost the same size as the Auditorium, which is used for the winter show. Bart J. Ruddle, assistant secretary and manager of the dealers' association and director of all Milwaukee shows, has been appointed superintendent of motor cars by the board of state fair managers.

#### D. C. WOULD RETALIATE.

Washington, D. C., Feb. 16.—During the discussion of the District of Columbia appropriation bill prior to its passage many of the Senators rose in wrath against the treatment they had been receiving from Maryland in the matter of motor car licenses. The appropriation bill carries with it an annual tax of \$5 instead of the permanent license of \$2 as heretofore on all cars up to 30 hp. and an annual fee of \$10 on cars above 30 hp. In addition, owing to the wrath mentioned, it carries a provision that cars from Maryland must get an annual license hereafter unless Maryland repeals its present law under which the car owners in the District must take out Maryland license.

Senator Blair Lee of Maryland contended that Maryland has spent \$25,000,000 on its roads and it is not fair for persons either permanently or temporarily residents in the District of Columbia to use these roads without helping somewhat to pay for them. Senator Lodge of Massachusetts answered that New England has unusually good roads which in summer are filled with tourists from every state in the union and the District, but who are not compelled to pay state license fees there. Senator Reed of Missouri attacked the constables of Maryland who, he said, hover across the District line, waiting to grab any motorist who crosses into Maryland without a Maryland license tag. The House was to consider the bill later.

# TRADE CONDITIONS IN ST. LOUIS

## FOURTH CITY IS MERCHANDISING FIELD TO WHICH UNUSUAL PROSPERITY HAS COME

**S**T. LOUIS, Mo., Feb. 17—St. Louis is a merchandising city. The pleasure car dealers here expect to do 100 per cent more business in 1917 than during 1916. Truck dealers expect to do 200 per cent more. Just how many machines this will be is another question. Trade conditions offer almost boundless possibilities. It is the fourth city; 825,000 persons live in the city, 1,000,000 in the immediate trade district and 40,000,000 within 500 miles. It is the only city of size that has not had a freight embargo declared against it this winter, and this fact is attracting many large manufacturing concerns, who are establishing assembly plants and branch factories here.

### A Difficult Territory

St. Louis trade territory is a difficult territory. The St. Louis territory is considered to be the eastern half of the state, southern Illinois, western Kentucky and western Tennessee. Few local dealers have less territory than that. Some control further territory. The Packard is sold in Kansas and Oklahoma from St. Louis as are the Jackson and Allen in Arkansas, while the Oakland agency here includes Arkansas, Louisiana and Mississippi. The tendency is to give even larger territory to St. Louis dealers.

As to the number of cars that are possible sales during the coming year: The state department is prepared to issue 150,000 licenses this year. It appears from recent figures that St. Louis should sell, wholesale and retail, 65,000. An ultra-conservative dealer places the coming year's business at 45,000 cars.

### Figures Prove Opportunity

St. Louis is a merchandising city. Eugene Smith, secretary of the Merchants' Exchange, has figures to prove it. The 1915 jobbing was: Dry goods, \$75,000,000; groceries, \$65,000,000; boots and shoes, \$55,000,000; lumber, \$40,000,000; woodenware products, \$20,000,000; electric industries, \$18,000,000; soaps and candies, \$16,600,000; tobacco and cigars, \$55,000,000; hardware, \$50,000,000.

Statistics for 1916 have not been tabulated, but the increase is estimated at not less than 30 per cent in any of these lines, and in hardware, electric supplies and shoes the figures are expected to run even higher. No comparisons as far as farm implements, vehicles and motor cars are concerned are available from the exchange. They are grouped in 1915 at \$20,000,000.

This increase in jobbing trade is one reason why St. Louis dealers can expect to sell more cars than ever before. An-

### DEALER SITUATION

other is the increase in bank clearings. The clearings for 1916 were more than \$1,000,000,000 higher than those of 1915, while January, 1917, showed an increase over January, 1916, of more than \$60,000,000. Beer is an important industry in St. Louis, and it amounts to about \$35,000,000. The motor car equipment business is a growing one. Two new tire concerns, several body factories and some specialty factories have been established. A heavy building year is foreseen in view of the \$3,000,000 in bonds voted for schools.

### Country Largely Farming

The nearby country is agricultural largely. Last year was a record breaker in prosperity. The Illinois coal mines are working to capacity at high prices, and the Missouri lumber and zinc regions are busy. The only drawback is a shortage of labor. The Southern states have a wonderful prosperity. Oklahoma and Kansas oil and wheat beneficiaries are buying high priced cars.

As to trucks: The dealers report the factories are at the height of production through war orders. Truck selling here is chiefly a question of energy and demonstration, and local dealers seem strong in both. The opening of the free bridge across the Mississippi has opened a vast field. The cheapest toll previously for a car was 70 cents a round trip. Heavy vehicles paid more. As a result, merchants waited until freight cars came across, even when switching tonnage was charged and terminal blockades delayed shipments. Now coal and other firms want trucks for hauling freight across the city bridge, which is free. One coal firm is negotiating for a dozen high priced trucks and more trailers.

### Ford Contracts Almost Double

The Ford dealers here have contracted to sell 5,000 cars against 2,600 last year. They are ahead of the schedule now and think they will sell more. Hundreds of families with small incomes now have machines. Two were sold recently to brewery employees who live on their earnings and savings. The Chevrolet dealers report

### AIRPLANE MAKERS ADMITTED.

New York, Feb. 16—So important are the strides made in the aeronautic industry considered that the Motor and Accessory Manufacturers' association has decided to admit makers of airplane engines, parts and accessories to membership.

much the same prospects. One of them ran a hotel before he sold cars. He now has sold his cook in the hotel a car.

Another great reason for continued prosperity and the resulting sale of cars is that the Allied armies have bought 230,000 horses through the East St. Louis horse and mule market since the war began, paying more than \$42,000,000 for them, an average of about \$190 an animal. Every team sold meant money for a car, and gasoline is cheaper than hay at present.

### No Munitions Orders Excitement

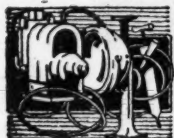
St. Louis manufacturers have not got excited over munition orders. The city has done as little business along this line as any city of importance, and most of the factories that took munitions contracts have got rid of them and now have their employes working in other lines. The shoe dealers refused to take any orders for foreign army shoes but are overwhelmed now with orders for civilian shoes for the warring countries. The electrical concerns and a few foundries took some orders but have completed them and turned to other lines without loss of working force. About the only lines continued are gun stock factories, and these have prepared for the future.

St. Louis dealers have to fight an unnatural division of territory. The makers divide Missouri in half north and south, whereas the natural division is east and west. The trade follows the railroads, and the line is drawn diagonally across the state, beginning at a point on the east side, 50 miles south of the northeast corner, to a point on the west side, 50 miles north of the southwest corner. Thus the Chicago-Kansas City railroads and their immediately territory is thrown to the Kansas City dealers, and the St. Louis roads to the southwest and immediate territory are thrown to the St. Louis dealer.

### Division of Territory

Hannibal, which is on the Mississippi river and appears to be in St. Louis territory, goes to Kansas City, while Springfield, which is in the southwest corner and appears to be Kansas City territory, comes to St. Louis. The trade follows these lines, and the efforts of the makers to change the natural divisions have served only to bring added difficulty of distribution. The territory on the mid-state railroads between St. Louis and Kansas City is no man's land. There is a trade war always on. A St. Louis motor car jobber once said he would give \$5,000 to any man who would convince his factory this is true.





# The Accessory Corner



## 11-in-1 Wrench

THE new Ronson wrench combines eight sizes of wrench in one. It claims to fit every nut on a car and to release the desired size with a twist of the hand. The wrench is made of drawn tempered steel in nickel finish and weighs  $\frac{1}{2}$  lb. It is 6 in. long and  $\frac{1}{2}$  in. thick. It is called the eleven-in-one because it claims eleven tools in the one tool. New features are the alligator jaw, screw driver and crown opener. Art Metal Works, Newark, N. J.

## Emergency Axle for Fords

This emergency axle stub will enable one to place a Ford car on wheels in less than 2 mins. in the case of a broken axle shaft, it is said. The car then can be pulled at any speed desired. The device is simple, as it merely hooks under the flange on the axle housing and a set screw on top when screwed down holds the stub firmly in place on the housing. The stub is made to take the Ford front axle cones, and a Ford front wheel is used. It weighs 7 lbs. Price, without cones, \$5. Ekern Bros. Mfg. Co., Flandreau, S. D.

## 2-in-1 Filling Gun

The Boe automatic oil and grease gun ranges in capacity from 27 to 100 lb. It dispenses and measures one or both kinds of lubricant separately or at the same time and retains the air-charge even though all lubricant is discharged. The entire top can be opened or closed for refilling in 4 sec. Charging is the same as for a tire. A 5-in. measuring dial is graduated to  $\frac{1}{4}$  lb. or  $\frac{1}{4}$  pt. The tanks come in red, blue and black finish. Prices, 27-lb., \$20; 32-lb., \$25; 100-lb., \$40. H. M. Boe Co., Minneapolis, Minn.

## Westmoreland Piston Ring

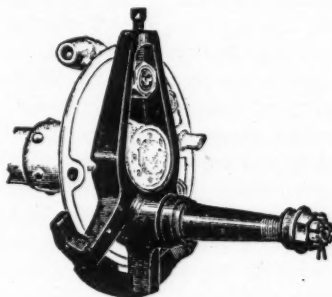
A new leak-proof piston ring has been invented by E. T. Westmoreland, Childress, Tex., which is said to have none of the common frailties of the double ring, such as unequal pressure from the rings, feather edges that break, excessively thin sections and so on. The ring is two-piece with a lap joint in the outer part and a bevel cut in the inner part. The two parts are constrained from moving on each other by the tongue and groove construction, and the two joints cannot move around together because of the dowel pin. The ring works equally well either side up and there is no possibility of wedging between the cylinder walls and the piston, it is claimed.

## Commercial Car Windshield

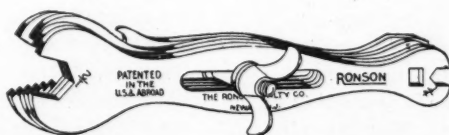
Banker commercial car shields are designed for application to all commercial cars or trucks. Being designed for this purpose they are built of extra heavy material to render them practically indestructible and afford the



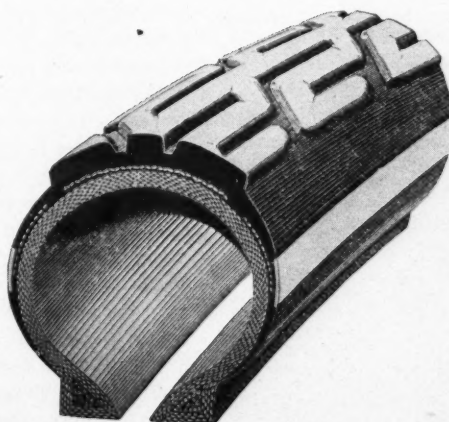
Filling gun that discharges both oil and grease



Device for placing Ford on wheels if axle shaft breaks



A wrench that is said to combine eleven tools



Cross-section of new anti-blowout, non-skid tire

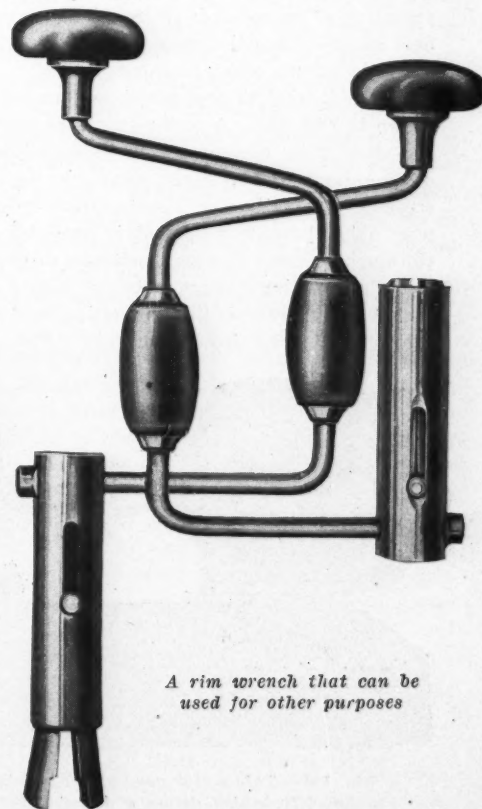
maximum of protection. Steel tubing, plate glass and channel rubber are used. The hinges are of the friction type, and the upper fold is adjusted for rain vision or ventilation by a slight turn of the wing nuts. Model 3 is of brass throughout to meet the requirements of commercial car owners and makers who do not desire the steel frame shield. Banker Windshield Co., Pittsburgh, Pa.

## Utility Rim Wrench

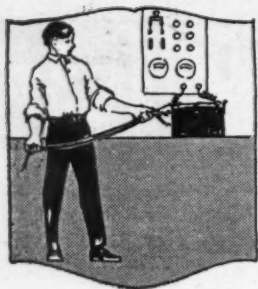
The Utility Universal rim wrench is designed for removing all nuts used on demountable rims but can be used for other purposes. It adjusts itself automatically and can be operated with both hands. It works as a bit brace, enabling the operator to exert much pressure. When not in use it can be folded and carried in the tool box. Price, \$1.50. Hill Pump Valve Co., Chicago.

## New Amazon Tire

The Amazon Tire & Rubber Co. has placed on the market a new tire that is said to be proof against blowouts. The anti-blowout feature consists of an extra fabric reinforced, or breaker strip, built into the side walls of the tire. The side-wall breaker encircles the tire, binding it into a unit and preventing the side walls from bulging or overstretching. The tire is made in the non-skid style only and has a jet-black body with a 1-in. white stripe on the sides. Amazon Tire & Rubber Co., Akron, Ohio.

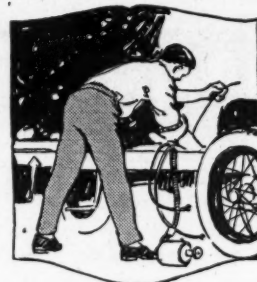


A rim wrench that can be used for other purposes



# Electrical Equipment of the Motor Car

*By David Penn Moreton & Darwin S. Hatch.*



*Editor's Note—Herewith is presented the thirty-second installment of a weekly series of articles begun in MOTOR AGE issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently. It is expected that the book will be published about April 1.*

## Part XXXII—Electric Motors—Motor-Generator

THE compound motor is a combination of the series and shunt. When the magnetizing action of the series field opposes the magnetizing action of the shunt field the machine is called a differential compound motor. When the magnetizing action of the two fields act in the same direction the machine is called a cumulative compound motor.

### Motor-Generator

The motor-generator is a combination of a motor and a generator, mechanically connected together and usually mounted on a common metal or wooden base. The motor of such a combination may be either a direct-current or an alternating-current motor, and it may be constructed to operate on any reasonable value of voltage, depending on the particular requirements. Likewise, the generator may be one capable of delivering either direct-current or alternating current, and this current may be delivered at almost any voltage, depending on the requirements, which determine the construction of the generator. When the two machines are coupled directly together by a flexible coupling their speed will be the same. If a belt or gear is used in connecting them, their speeds may be the same or different, depending on the size of the pulleys or gears used. The electrical operation of the motor is entirely independent of the generator. The field of either machine may be varied in strength without changing the field of the other machine.

A combination of two machines forming a motor-generator set is shown in Fig. 189. A motor-generator outfit may be used in changing alternating current at one voltage into direct current at some other voltage or vice versa, or it may be used in increasing or decreasing alternating or direct-current voltage. For example, suppose only alternating current is available and you wish to charge storage batteries. The motor element of your motor-generator should be an alternating-current motor of such a construction and voltage that it will operate on the alternating-current circuit from which you are to obtain the electrical energy. The generator element should

be of such a construction that it will deliver the required current and at the proper voltage. The horse-power capacity of the motor always should be such that it will drive the generator when the generator is delivering its full load.

In some cases direct-current is available but at such a voltage that it cannot be used economically in charging storage batteries unless the batteries be connected in series, which is quite inconvenient and often times impossible. In such cases it often results in a large saving to install a motor-generator set composed of two direct-current machines, the motor being constructed to operate on the voltage available and the generator to deliver current at the proper voltage to charge the batteries. Remember that the output of the generator in watts would be equal to the input to the motor in watts if there were no losses in the machines. That is, if the voltage of the generator is less than the voltage of the motor, then the current the generator will deliver will be greater than the current taken to operate the motor. On account of losses in the two machines the output of the generator is always less than the input to the motor.

### Dynamotor

The dynamotor is a machine having an armature with two windings and provided with two commutators which may be mounted on the same or opposite ends of the armature. Both of these windings revolve in the same magnetic field, and any change in the strength of the magnetic field will influence the value of the voltage generated in both windings. The voltage generated in the two windings will be the same if there are the same number of turns about the armature in each of the windings. If the number of turns in the two windings are unequal the voltages generated in the two windings will bear the same relation to each other as exists between the number of turns, the winding of larger number of turns having the greater voltage induced in it.

Both of these windings may be used to deliver current; that is, both windings will act as generators when the armature of the machine is driven in some way as by a motor or gas engine.

One winding may be used as a motor and drive the other winding in the magnetic field, and it will act as a generator and may deliver current. The voltage at which the generator winding will deliver current depends on the ratio between the number of turns in the two windings and the voltage applied to the motor winding, neglecting voltage losses in the two windings. This voltage relation is fixed by the relation of the turns in the two windings and cannot be changed by varying the strength of the magnetic field as in the case of the motor generator for the following reasons:

If the field of the dynamotor be increased in strength in an attempt to increase the voltage generated in the generator winding, there will be a decrease in speed of the armature, as the necessary counter-electromotive force now will be generated in the motor winding at a lower speed since the field strength has been increased. This decrease in speed of the armature counteracts the effect of the increase in field strength so far as the generator winding is con-

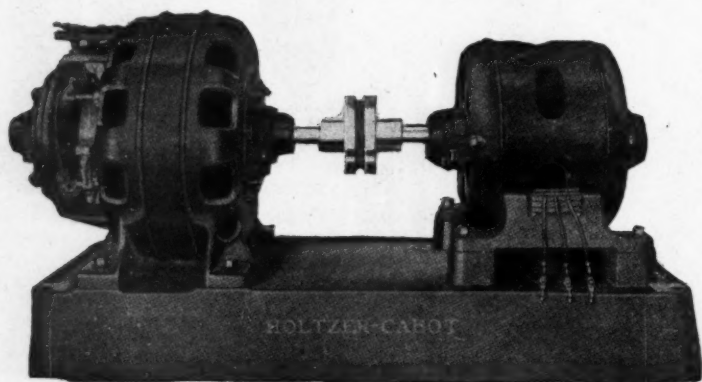


Fig. 189—This motor generator consists of an alternating-current motor, left, which drives a direct-current generator, right



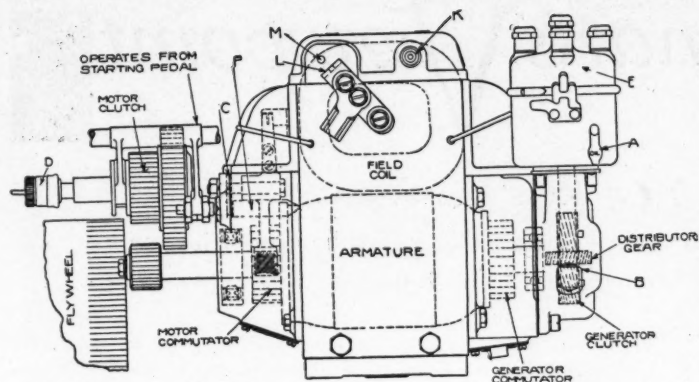


Fig. 190—Side view of Delco dynamotor, which usually is called a motor generator

cerned, which results in the voltage generated in the generator winding remaining practically constant. If the voltage applied to the motor winding be increased or decreased there will be a proportionate increase or decrease in the voltage produced in the generator winding. The fixed voltage relation in the dynamotor is its chief disadvantage when used in charging storage batteries, as the current sent through the battery must be adjusted by a series resistance rather than by varying the field of the generator as in the case of the motor generator.

### The Dynamotor as a Starting and Lighting Unit

The dynamotor is used by several different companies in place of a separate generator and motor. The electrical and mechanical connections of the machine are such that the generator and motor actions are taking place at different times. A good practical example of the use of the dynamotor is found in the Delco system shown in Fig. 190. The terminals of the two sets of windings are brought out at opposite ends of the armature and connected to separate commutators. A diagram of the two windings is given in Fig. 191. There are nineteen segments in the commutator of the motor and just twice as many, or thirty-eight, in the commutator of the generator. These windings are placed in the same slots in the armature core. The magnetic field of the machine is produced by either a shunt or series

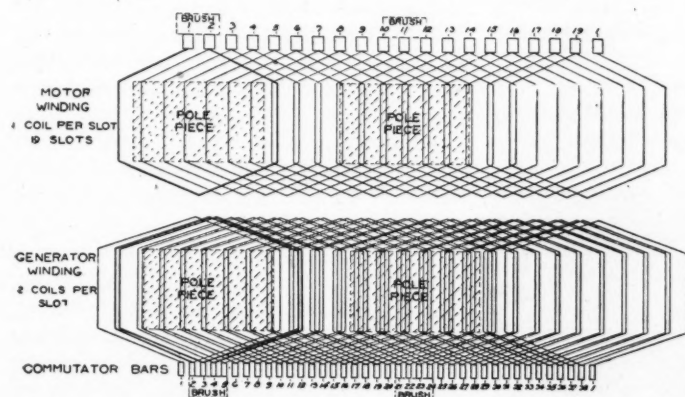


Fig. 191—Comparison of motor and generator windings on Delco dynamotor

coil, depending on whether the machine is acting normally as a generator or as a motor. The operation of the Delco dynamotor may be divided into three distinct parts, and these are:

- Motoring the generator.
- Cranking the engine.
- Generating electrical energy.

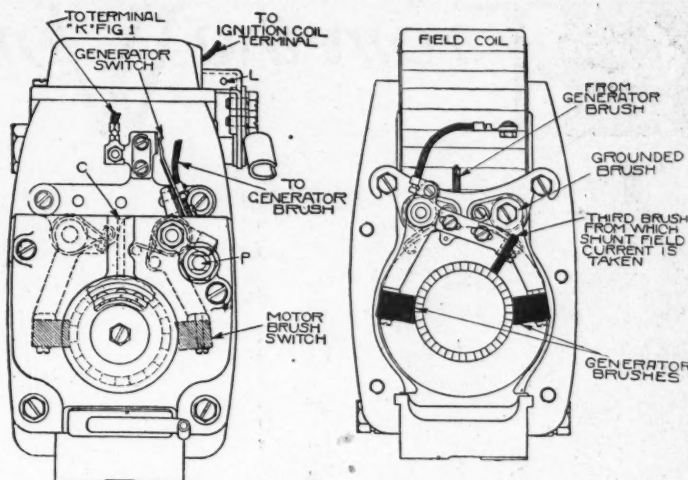


Fig. 192—End views of Delco dynamotor

Before discussing each of the above operations it will be best to explain what changes in connections take place when the ignition switch is closed and the starting pedal is pressed down. Closing the ignition switch connects the generator armature winding and shunt field across the terminals of the storage battery. As the starting switch is pressed down one of the brushes on the commutator of the motor, which normally is raised from the surface of the commutator, is lowered; a switch in series with the armature of the generator is opened; and the gears used in cranking the engine are thrown in mesh. See Fig. 192.

(a) When the armature and field of the generator are connected to the battery by closing the ignition switch a motor action takes place in the generator armature winding, and the armature starts to revolve. The connection between the shaft of the dynamotor and the engine is made by a form of over-running clutch which only transmits power when the shaft driven by the engine tends to run at a greater speed than the shaft of the dynamotor. This clutch, called the generator over-running clutch, allows the armature of the dynamotor to revolve freely, when the engine is standing still, in the same direction as it is rotated by the engine when the dynamotor is being operated as a generator.

(b) The motoring of the generator assists in bringing the gears into mesh when the starting pedal is pressed down. Lowering the brush on the commutator of the motor closes the motor circuit, which is composed of the motor armature winding and series field connected in series to the battery. At the same time, the motor action in the armature of the generator is stopped as the generator switch is opened. The dynamotor now is operating as a series motor and driving the engine. As soon as the engine starts to fire the motor will cease to transmit power to the engine, as a second over-running clutch in one of the gears allows the speed of the shaft driven by the engine to exceed the speed of the shaft of the dynamotor. The starting pedal now should be released, which raises the motor brush and closes the generator circuit.

(c) As soon as the engine speeds up power will be transmitted to the dynamotor through the generator over-running clutch. If the generator switch is closed a generator action will take place in the generator armature winding, provided the voltage in this winding exceeds the voltage of the battery to which the brushes of the generator are connected. When the voltage in the generator armature winding drops below the voltage of the battery, due to any cause, the generator will be changed to a motor, and power may be transmitted to the engine through the motor over-running clutch. A more complete description of this and other similar systems will be given later when the various complete systems are discussed in detail.

### NEXT WEEK

The articles on Electric Motors will be continued in the next installment of the series on Electric Equipment of the Motor Car. If you have missed the first issues on this subject, you will find that the articles began in the issue of Dec. 14.

# From the Woman's Viewpoint

## Now It Is the American

The Women of This Country Get Ready to Give First Aid in Nursing or in Motoring as Their European Sisters Are Doing



Mrs. Gurnee Munn of Washington wins the first heat of the women's Red Bug race at the country club.

AND now it is the American woman! Gone is the sense of detachment with which some of us have been reading of the European woman, who works in the munitions factory, who drives the tram in the city streets and who picks up the taxi fare at convenient corners. For the possibility of the same situation in a more or less pronounced form has been brought home to this country, and no one can be sure that the American woman will not be doing the same work in the not distant future.

No sooner had the United States broken diplomatic relations with Germany than the women began to plan organizations and work that would aid the United States, and no little of that planning is being done by

women motorists, who intend to extend their motoring ability to include motoring service, if such is necessary. Of course, the Red Cross classes started at once. Nowadays, anyway, the Red Cross is a form of motoring in some respects. Take the example of the European opportunity given the Red Cross and the women connected with it to show their ability. Women who go out from England as part of the Red Cross corps do so more often than not as trained drivers of motor cars who can do the ordinary repairing when occasion and need arises.

Motoring reserves already have been formed and offered to the Government by the motor clubs. Proposed nursing corps

are to be motoring reserves in which the women would equip the reserve with motor cars to give the most speedy and efficient service wherever they might be needed.

Many women motorists in Chicago are using their cars now to drive to the different places about the city at which classes in nursing and so on are being held. The society woman and the girls from the stores and offices are interested in much the same thing, whether they arrive and depart in motor car, on street car or afoot.

The activities of the Government in buying trucks have aroused the interest of some women and the envy of others. The interest seems due mostly to the preference for motor-driven vehicles in the army that seems likely to come over the army as well as the public at large. The envy, as one woman put it, is because there will be so many opportunities to drive trucks and not a one to drive, that is, for a woman.

### An Excuse to Learn

The new excitement in the air has given a woman a chance or an excuse to learn more about the inner workings of a motor car. The society woman who found it too obviously unnecessary ever to know anything at all about a car, even if she did run it from time to time, now thinks this a good chance for her to get ready that knowledge that may be required of her or others of her gender in the future. The woman who knows she can manage a car, and would if she could get hold of one, is as ready as her English sister to take up the work.

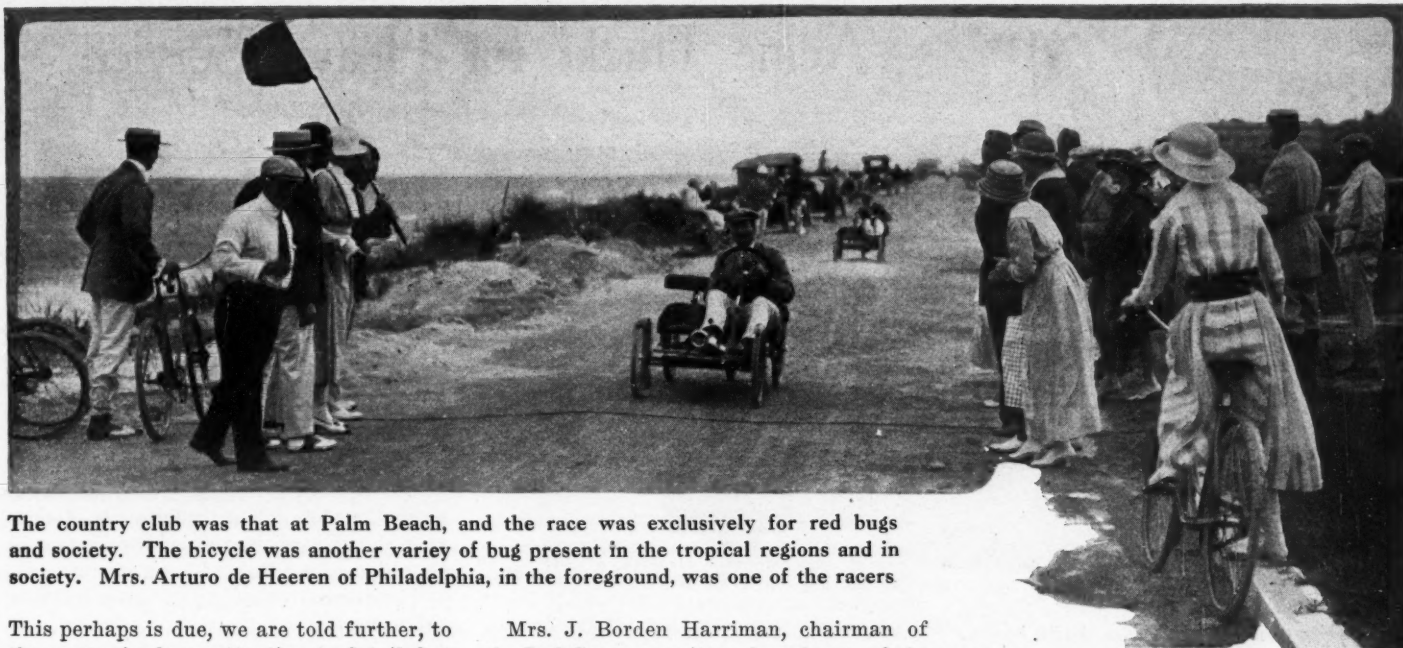
In England, you know, the women even drive the trucks, as impossible as that appears to be from the woman's viewpoint. The heavy, clumsy mail truck on the streets of London rolls and lumbers along at the instance of the frail woman. The delivery truck of the department store has as a driver another frail woman. And both have their hundreds of associates.

Even while the women of the war-ridden countries have been working in the munitions factories, American women have been working in the motor car factories of this country. Their work has brought the same general result as has that of the European women. The output is increased at the same hours and machines, and efficiency everywhere has gone up a notch. For particular work it is said that the woman worker can be depended on to accomplish a good deal more than the ordinary man laborer will.



Some of Boston's prominent women are preparing for real service to the country. They are to take fifteen lessons in motor car repairing. This is planned by the active corps of the Special Aid Society of American Preparedness





The country club was that at Palm Beach, and the race was exclusively for red bugs and society. The bicycle was another variety of bug present in the tropical regions and in society. Mrs. Arturo de Heeren of Philadelphia, in the foreground, was one of the racers

This perhaps is due, we are told further, to the women's closer attention to detail, but be that as it may, the conclusion remains that, given the need, the women of this country can serve as well as the European women are in the manufacture of munitions and other goods for which the regular producers no longer are available.

It is to be hoped, of course, and strongly, that to this country of ours there will not come the need such as Europe has, that it will be granted to us to see no conditions such as are now existent across the ocean. But it is always safe to be able to meet them and good to know that we can meet them.

#### To Strengthen Motoring Bond

If nothing further comes of this new interest of women than that their part in the motoring world become more assured, it will be a great thing to have them continue to offer the services of themselves and their cars, their nursing and their driving, until the acquaintance of woman and the car is so developed that the bond can never be broken.

For the motor car is a great factor in making communities and friends, as well as a health given and an entertainer. With its coming have come better health for the public in general and for the owners in particular. It has made known to more of us different parts of our country, our state, our country and has opened wide the door that leads to the open highway and its possibilities. What is more logical than that women should consider the motor car in planning the bit they can do to preserve that country, if the sad day come that its peace is taken?

### What Is Going On

The National Red Cross at Washington, D. C., has mobilized fifty-five Washington society women to serve as ambulance drivers in case of war. Women in every phase of life at the Capital will be mobilized and signed for service.

Mrs. J. Borden Harriman, chairman of the Red Cross committee, has charge of the work. Mrs. Augustus P. Gardner, wife of Representative Gardner of Massachusetts, is vice-chairman. Others who are interested are Miss Margaret Perrin, Mrs. Joseph Leiter and the Countess Gizycka.

The National League for Women's Service, New York, and the first division of the Women Motor Drivers' League, Atlantic City, N. J., are to prepare American women to take the place of men in motor bus or street car transportation or to take ammunition, food, ambulance and relief motor cars into fighting territory. In case of actual invasion, these forces are to carry the women and children from the invaded territory.

Mrs. I. Wolcott Thomas is chairman of the motor division of the National League and has started a class for women drivers at the West Side Y. W. C. A., New York. Mrs. Mary Walker Harper is the organizer of the Women Motor Drivers' League and

has offered its services to Governor Edge of New Jersey and President Wilson.

Plans to organize a Woman's Nursing Corps are being considered in Chicago. One of the leaders in the movement is Mrs. Roy Durham, a member of the Chicago Political Equality League. She drives her own car and plans to use this car in carrying out such duties as may be her part in the event of trouble with Germany.

The idea is to equip the corps with motor cars to make it give the greatest efficiency in being at the place at which service is most needed.

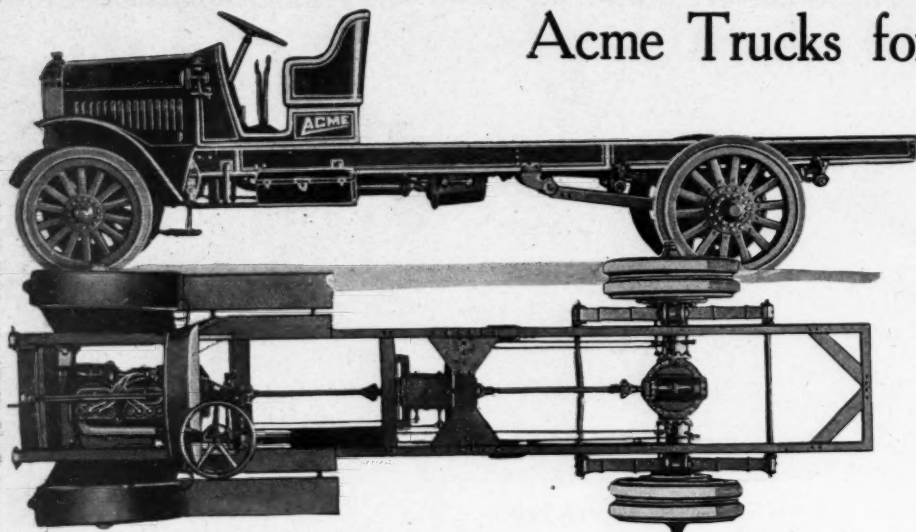
Thirty Chicago women met at the Chicago Automobile Club and decided to organize a unit for ambulance driving.

Many said they were willing to go to the front in case of war. Others, who cannot leave their homes, offered to do recruiting duty in Chicago. Mrs. John B. Sardy of Oak Park is captain of the unit.



In case of war the Boston women expect to be able not only to run motor cars, but to repair them. Not so far a cry from women's work in former times of war, considering other changes in warfare

## Acme Trucks for Heavy Service



The heavy frame section and cross members, also the amidship location of the gearbox are shown in these views of the 3½-ton Acme truck

THE line of Acme trucks, built by the Cadillac Auto Truck Co., Cadillac, Mich., has been rounded out with a new 3½-ton model, designed to meet the requirements of heavy hauling. The two present models are of 1- and 2-ton capacity.

The new job is a worm-driven truck which may be fitted with any type of special or dump body to meet particular hauling problems. The wheelbase is 168 in. and the standard loading space 150 in. There is a short turning radius for the length of the truck, the figure being 29 ft. The tread, front and rear, is 66¼ in. and 65¼ in. respectively.

### Continental Engine Used

The engine is a Continental with a 50 hp. rating, based on brake-test figures from the engine factory. This is a four-cylinder L-head type with the cylinders cast in pairs, bearing dimensions of 4½-in. bore and 5½-in. stroke. The engine is three-point suspended with gearset amidships and connected with the engine through two universals. There are two more universals on the propeller shafts.

The engine is fitted with a Piece governor which permits a maximum speed of 1200 r.p.m. regulating the maximum truck speed at 14 m.p.h. Fittings which are in common with the other Acme models are: Rayfield carbureter, Eisemann magneto and Stewart vacuum feed.

Differing from the construction of this model are the 1- and 2-ton types in which the gearboxes are mounted in unit with the engine. Because of the length of the new model it has been considered advisable to fit the gearset amidships to unify the lengths of the driving mediums; also to distribute the weight more evenly.

The gearset units are of the sliding-clutch type with the gears always in mesh. These gears, instead of revolving with the shaft by means of splines, run free and connection of the shafts and gears is brought about by a series of dog clutches. One part of the clutch is a unit with the gear forging while the other slides on the

shaft. The clutch arrangement is such that, when the gearset is in high, the other gears are idle. Three speeds forward and a reverse are provided in all models.

In the new model the ratios are as follows: First, 4 to 1; second, 2 to 1; third, 1 to 1, and reverse 4.125 to 1, with a rear axle reduction of 10.33 to 1.

The axles, front and rear, are of Timken make and the rear axle is a floating type. As the total rear-axle reduction is 10.33 to 1 and the low-speed reduction 41.33 to 1, there is sufficient power in this speed to pull the truck under any condition as long as traction exists.

Whereas Hotchkiss drive is used in the two smaller models the new truck utilizes radius rods to bear the propulsion effort. The radius rods are semi-flexible, eliminating the need of universals and permitting a simple assembly. Torque is absorbed through the springs as in the smaller models.

Another new feature in Acme construction is the use of a cast radiator tank instead of the sheet-metal tanks used on the smaller trucks. This is adopted because

### Gearset Centrally Located Between Four Universals

it is considered that, because of the heavier spring design, more severe impacts will be transmitted to the radiator than in the lighter models. The radiator is detachable and is supported from the bottom on a cushion base. It is of Long manufacture and receives circulation through a centrifugal pump.

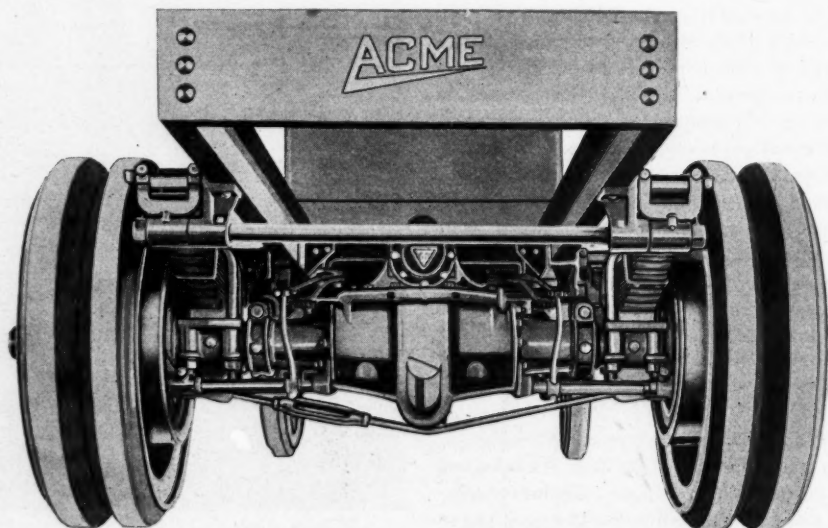
The frame is a unit of great strength. It has an 8-in. section and is made of rolled steel channel fitted with heavy-webbed cross members.

Although the truck has a 168-in. wheelbase as standard it will be furnished longer upon special order. It is equipped with a 27-gal. gasoline tank, 36 by 5-in. tires with 40 by 8-in. singles or 40 by 5-in. duals in the rear as optional. The price is \$3,000.

### INDEPENDENT TO OPEN PLANT

Davenport, Iowa, Feb. 16 — The Independent Auto Truck Co. will open a plant in this city to build a truck selling at \$1,100. The company will be incorporated for \$50,000, the incorporators being Charles Zoller and E. August.

Three buildings, comprising the southwest portion of the Independent Brewing and Malting Co., have been converted into a manufacturing plant. About 24,000 sq. ft. of floor space will be utilized by the company. With the exception of the axles all the parts will be manufactured at the local plant.



A worm-drive Timken axle is used in the big Acme truck. Dual wires are shown here, although singles are optional



# Front-Drive Two-Unit Truck

## Pull-More Separates Power and Weight Carrying Assemblies

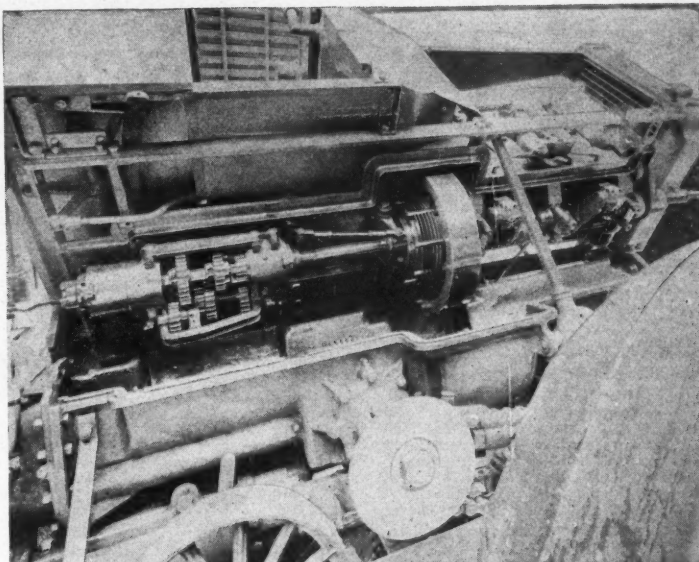
**A** CCESSIBILITY of every part of the powerplant, front-wheel drive and a detachable front unit consisting of powerplant, front wheels and cab are the outstanding features of the 3-ton Pull-More truck to be placed actively on the market beginning March 1, 1917, by the Pull-More Motor Truck Co., Pittsburgh, Pa., with a factory in New Castle, Pa.

### Accessibility a Feature

Accessibility of the powerplant is secured by mounting the engine, clutch and gearset in the upper half of a hinged casing which fits into a barrel-shaped casing corresponding to the lower half of the crankcase of an ordinary motor except that it encloses all the driving mechanism between the engine and the jackshaft, including the differential. When it is desired to inspect or get at any part of the engine, clutch, gearset or differential, the upper half of the case is revolved upward about its side hinges by a screw jack operated by means of a crank applied on the end of a short turning shaft extended forward to the front of the radiator. This upper half of the casing is carried on a framework which supports the cab, radiator and hood, this entire assembly turning over as the joint between the upper and lower halves of the casing is opened to expose the interior members.

The turning of the cab is made possible without making any mechanical disconnections by mounting the steering column on a universal joint and similarly arranged

*This shows the compact engine, clutch and gearset assembly of the Pull-More truck, with the cab, hood and radiator rocked out of the way*



links in the foot brake on the driveshaft outside of the casing at the rear and the hand brakes on the rear wheels.

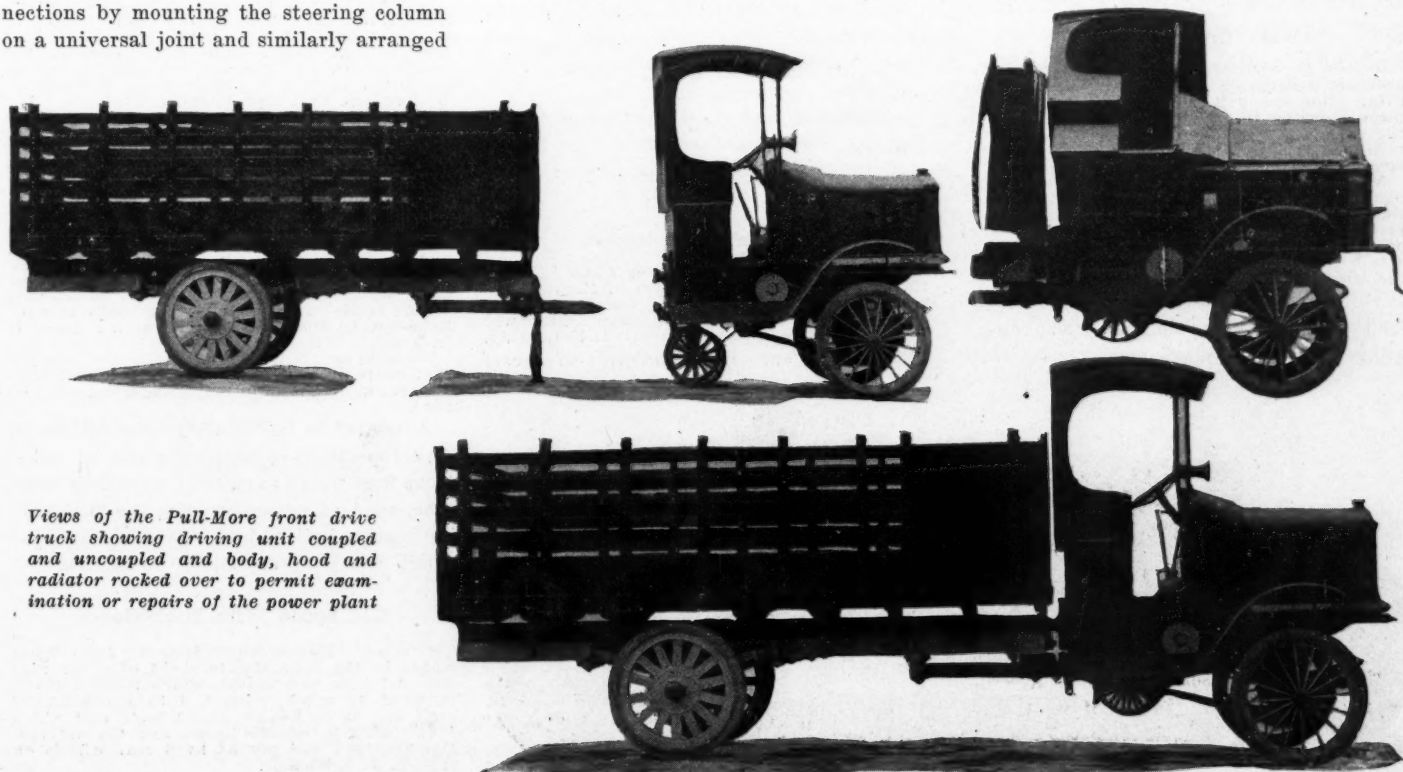
The engine is a stock Buda except for the crankcase. It has its cylinders cast in block with the valves at the right. It is cooled by means of a centrifugal pump circulating the water from a vertical finned-tube radiator with a cast case. The engine is fed by gravity from a tank carried in the dash. The engine speed is controlled by a Pierce governor. Ignition is by a single system and electric starting and lighting may be had at an extra charge of between \$150 and \$175.

From the engine the drive is taken through a Borg & Beck clutch to a three-speed selective gearset of Warner make. The driveshaft extended aft of the gearset is provided with a spur gear on its rear end. This meshes with another similar

gear mounted on a parallel shaft directly below which extends forward to a jack shaft at a point just behind the clutch. The jackshaft is carried in the lower half of the casing, the drive being taken by outside chains and sprockets to each of the steering knuckles.

Each wheel is carried on a stub driving shaft and the drive taken in much the same manner as in the Panhard four-wheel-driven tractor. A hollow steering knuckle housing is employed in which there is a vertical idler shaft with bevel gears at top and bottom.

As standard equipment, the load unit consists of a dead axle, springs and body frame of conventional type, although the absence of any driving mechanism will enable the Pull-More company to offer load units with platforms as low as 18 in. as special equipment.



*Views of the Pull-More front drive truck showing driving unit coupled and uncoupled and body, hood and radiator rocked over to permit examination or repairs of the power plant*



# The Readers' Clearing House



## FORD VIBRATES WITH SKID CHAINS If Tires Are Pumped Up Hard Chains May Cause Jumping

Los Angeles, Cal.—Editor MOTOR AGE—My Ford runs in good order and ordinarily is very quiet, but as soon as I put skid chains on it vibrates very badly, especially when running from 12 to 16 m.p.h. What is the reason? The noise stops as soon as the chains are removed.

2—Give me your opinion as to the benefit derived from a combined manifold, the idea being, as I understand it, to have the heat from the exhaust manifold warm the gas in the intake manifold. Would the outlay and expense be more than the gain received.

3—Some issues back I noticed an item relative to cutting the exhaust pipe to fit on a cut-out for the muffler. I do my own work, having driven a car for 2 years, averaging about 6000 miles a year. Five of the men in the office, who drive the same make of car, work together. We are thus able to exchange ideas and tools, keep tab on results from gasoline, oil, etc. In putting on cut-outs I found that the V-shaped cut did not allow of free movement in the butterfly valve, so I used a hacksaw and cut them in as per the sketch, Fig. 2. The work is simple, and with a little asbestos paper a good tight joint can be made. In performing this job saw from A to A and from B to B. Then diagonally from A to B as shown. The points can then be bent up and sawed as shown in the dotted lines. This leaves a clear cut half way through the exhaust.—W. C. Brown.

1—It is difficult to understand why skid chains would cause your car to vibrate. If it were the case that you carried your tires with excessive pressure we could conceive of a condition in which each cross chain would cause the wheel to bound. Of course it is true that there must be some vibration transmitted through the tires by the action of bumping from chain to casing and casing to chain.

2—Such a system, if properly designed, is highly satisfactory. The saving in fuel and increase in power is appreciable.

### Wear On Valve Stem

Toledo, O.—Editor MOTOR AGE—What is the probable wearing effect on a valve lifter, valve-lifter guide and valve-lifter adjusting screw, if the valve lifter in a motor is not centered below the valve stem? The valve lifter is of the non-revolving type and is off center with the valve stem about  $\frac{1}{4}$  in.

Would not this condition be apt to cause more wear on the lifter and guide than if it were properly centered and would not the adjusting screw in time have a slight depression on one side that would make it difficult to obtain the proper amount of clearance between the screw and the valve stem?—A. H. P.

Yes and no. If the valve lifter were offset to such an extent that its lifting would bring angular pressure against the stem

the wear would be greater. However, if the point of lift comes under the stem itself, even if way out at the edge, there is

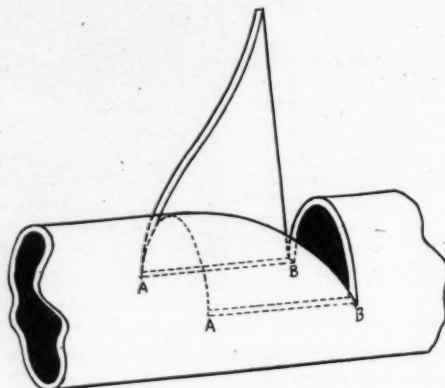


Fig. 2—Method of cutting exhaust pipe to fit on cutout for muffler a reader uses

going to be very little angular pressure. If we knew the dimensions of the particular motor with diameter of stem, diameter of lifter and amount of offset, we could give you a more comprehensive answer.

### Laws and Records

Dunlap, Cal.—Editor MOTOR AGE—Are the cars which try for transcontinental records forced to obey city traffic regulations?

2—From whom do they secure permits to exceed the speed limit?

3—Would MOTOR AGE give space for a story if a juvenile racing driver would cross the continent in a junior car within what would be called a fast trip?

4—Illustrate the Ogren racing car which was driven by Tom Alley. Give the address of this concern.—Brent T. Harding.

1—Yes.

2—There are very few if any cities on the through routes from coast to coast which will grant such permit.

3—Yes.

4—The car and its driver are shown in Fig. 1. The manufacturer is the Ogren Motor Car Co., 2424 Milwaukee avenue, Chicago.

### No Official H. P. Records

DeKalb, Tex.—Editor MOTOR AGE—What is the maximum brake horsepower of the new sixteen-valve Stutz?

2—What is the maximum brake horsepower of the new sixteen-valve White?—L. F. Lindsay.

There has been no official test of these.

## DUAL IGNITION ON STUDEBAKER

Would Have to Have Current for all Engine Speed Demands

Trenton, Mo.—Editor MOTOR AGE—I have a 1916 Studebaker Six which has six valve caps fitted for spark plugs and six valve caps for priming cups. Could I fit the six priming valve caps so I could put six spark plugs in them, making twelve spark plugs in the motor, without changing anything else?

2—Would MOTOR AGE advise doing this?

3—Would the increased power, speed, quick acceleration and lessen fuel consumption?

4—Should headlight globes be changed every 6 months, or how often to secure best results?

5—Is it advisable to put Bricston treads over castings that are worn down to the fabric but have no holes?

6—Is there a six-cylinder truck made of over 2-ton capacity?—A Subscriber.

1—Yes, but the sparks are not very dependable.

2—With an L-head engine, the results rarely justify the trouble.

3—Practically there is not a great advantage with L-head engines.

4—Every 3 or 4 months is better.

5—Protectors of the type you mention will add to the life of old casings.

6—Yes. Gersix, 5000 lb.; Hurlburt, 10,000 lb. and 14,000 lb.; Tiffin, 10,000 lb. and 12,000 lb.; Stegeman, 5000 lb., 7000 lb. and 10,000 lb.

## SUBSCRIBER USER OF KEROSENE

Has Used It Exclusively in Radiator for Two Winters

Wautoma, Wis.—Editor MOTOR AGE—I have seen many inquiries in MOTOR AGE regarding the use of kerosene in the radiator and thought perhaps you would like to hear from someone who has actually used this and is in a position to give some information in regard to it.

I have used it exclusively for two winters, last winter in a Kritt car and this winter in an Overland. It does not evaporate in cold weather any faster than water does in hot weather. In cold weather the radiator seldom needs but very little added to the first filling; it does not heat any more than alcohol; the odor is no worse than wood alcohol; it will not ruin new rubber hose in a whole winter's run, but it will make the rubber come off from old defective hose quickly, and it has this advantage that you always know that you have the right mixture, whereas with alcohol you never know anything about it after you have run a few miles on account of evaporation.

Also, personally, I would not think of putting my machine up for the last of the winter days, when it is impossible to run on account of the roads, without filling my radiator with kerosene, because it prevents rusting while it is standing idle.

I would not, however, advise its use in a car that heats up very badly even when filled with water; it might then be dangerous.—R. K. Bird.

As stated in last week's issue of MOTOR AGE reports have been received of disastrous fires which have been caused by kerosene, used as an anti-freeze, the fuel having become ignited by ignition of the vapor which arises therefrom, due to the heat.

### Car Speed With High Gears

Buechel, Ky.—Editor MOTOR AGE—What would be the approximate speed of a car that has just been overhauled, which made a maximum of 45 m.p.h. with a 4 to 1 differential ratio and 32 by 3 $\frac{1}{2}$  in. rear wheels, and which I am going to change by gearing the differential 3 $\frac{1}{2}$  to 1 and put 34 by 4 rear wheels on it?—T. J. Schneider.

In a car equipped with 4 to 1 gear ratio

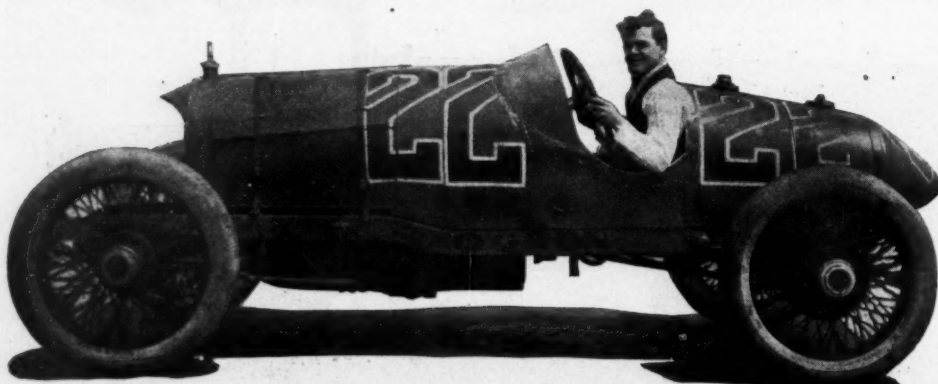


Fig. 1—Tom Alley and the Ogren racing car which he drove



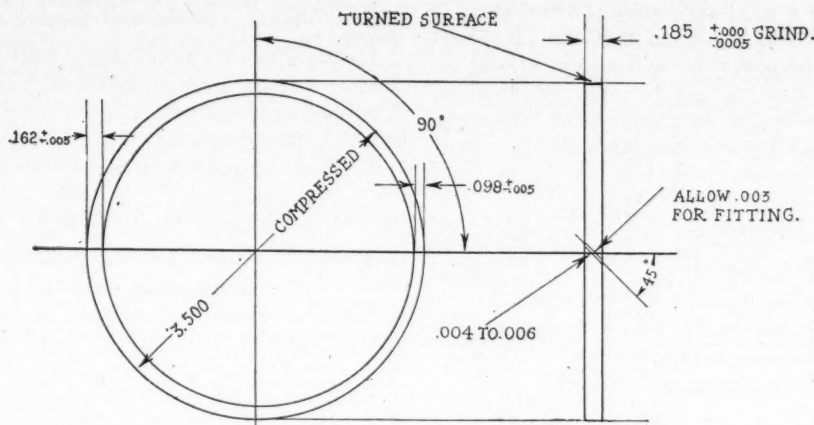


Fig. 3—Working drawing of plain cast-iron piston ring used in Westcott

and 32-in. tires traveling 45 m.p.h. the engine speed is 1890.4 r.p.m. In a car equipped with  $3\frac{1}{2}$  to 1 gear ratio and 34-in. tires traveling 45 m.p.h. the engine speed is 1556.8. Assuming the impossible, namely that the same engine will turn up to a speed of 1890.4 r.p.m. with the higher gearing and larger tires it evolves by solving the equation that the car would develop 54.6 m.p.h. This is impossible because of the fact that the engine has a greater load to carry and consequently develops less power under the same load. Although it is only an approximate figure it might be assumed that the reconstructed car would develop 50 m.p.h.

#### MOTH BALLS DISSOLVED IN GAS Are Supposed to Increase Explosive Proclivities of Gasoline

Minneapolis, Minn.—Editor MOTOR AGE—Will moth balls dissolved in the gasoline improve the running of a motor? What harm will it do, if any? How much should be used?

2—I have a 1914, B 37 Buick car. If it becomes necessary to run the car without the storage battery, what could be done to prevent harm to the generator from the excessive current? Will it help any to connect the generator wire to the frame, that is grounding it?

3—Does an ammeter use up any current?—M. T. Stenmo.

1—Moth balls are often used in the gasoline without doing any particular harm. It is claimed that they increase the explosive proclivities of the gasoline and thus give the engine more power. A dozen moth balls for 5 gal. gasoline is the amount generally used.

2—Nothing. Do not attempt to run the car without the storage battery.

3—Only the slight resistance imposed upon the current by the extra wires and the operation of the registering needle. It is so slight as to be negligible.

#### Pistons in Overland

Wheaton, Ill.—Editor MOTOR AGE—Could an Overland engine, model 83, be improved by using aluminum alloy pistons and connecting rods, or could better or same results be obtained by drilling holes in the old piston and connecting rods? If so, where and how many and what size holes ought to be drilled? Would MOTOR AGE consider the proper drilling of old pistons less expensive?—H. Rudolph.

The safest results could be obtained by installing alloy pistons. It would probably not be worth your while to install alloy connecting rods. Concerning the matter of drilling out the cast-iron pistons, it must be remembered that the makers have

designed these pistons for minimum weight with sufficient strength. Any more stock removed from them puts them below the safety limit, and there is the liability that they will give way under severe driving and damage or wreck your engine. MOTOR AGE does not advocate drilling the pistons.

#### A. L. A. M., N. A. C. C., S. A. E. HP. Explanation Clearing Matter of Horsepower Rating Formulas

Watseka, Ill.—Editor MOTOR AGE—What is the difference, if any, in the A. L. A. M., N. A. C. C. and S. A. E. formulas for rating gasoline engines?

2—Is it permissible to use any of these ratings when applying for a motor car license?

3—Publish a wiring diagram of the 1916 Maxwell.

4—In equipping the 1916 Maxwell with a dash light, having an individual switch, using current from the storage battery, where should it be connected with the ammeter showing the discharge; where connected so the ammeter will not show the discharge? Kindly show this on the diagram if possible.—Chas. E. Bauer.

1—There is no difference. All are the N. A. C. C. rating, and that is the correct name for this formula. A. L. M. A. is the abbreviation for American League of Automobile Manufacturers, which organization changed its name to the National Automobile Chamber of Commerce. Therefore the term A. L. A. M. rating is obsolete. S. A. E. is an abbreviation for the Society of Automobile Engineers, and this organization has no separate horsepower formula.

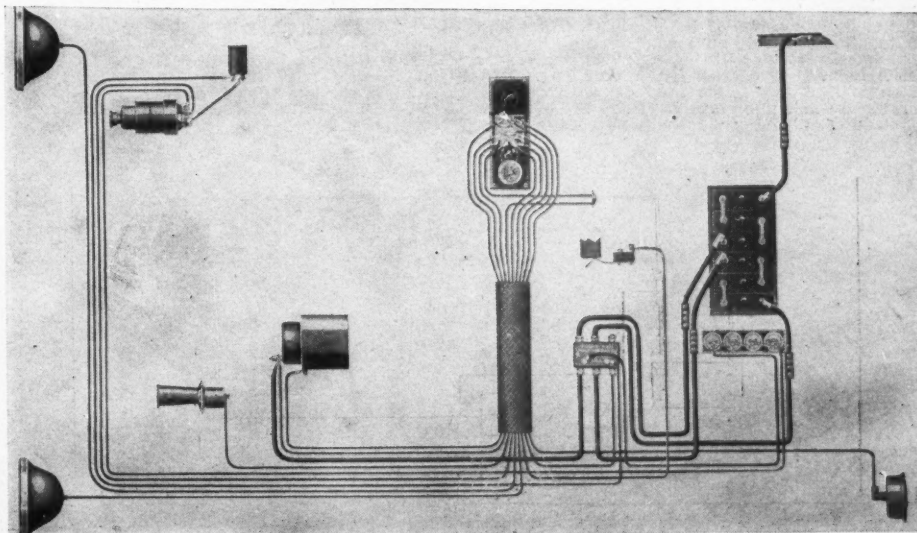


Fig. 4—Wiring diagram of the Maxwell

Therefore, the S. A. E. rating is the N. A. C. C. rating, and the latter insignia is the only one which should be applied to this formula.

2—The N. A. C. C. rating is the one upon which practically every state bases its license applications and is the correct one to send in when applying for a license.

3—This diagram is shown in Fig. 4.

4—To show charge it should be on a main wire beyond the ammeter; that is, it should be connected to that wire so that the ammeter, connected to the same wire, is between the light and the battery. To connect it so that discharge will not be shown it should be connected between the ammeter on the battery. The simplest way would be to connect it next to the battery terminal and run a separate wire to the dash-light switch.

#### NAMES OF THREE BRAKE LININGS Sketch of Piston Ring Used in 1915 Westcott

St. Louis, Mo.—Editor MOTOR AGE—What are the names of the brake linings used on the Packard Twin Six, Marmon 34, 1917 Pierce-Arrow and Resta's Peugeot?

2—What kind of piston rings were used in the 1915 model U-50 Westcott? Kindly give sketch.

3—If a non-leaking piston ring is used in each piston on the above Westcott, which ring should it replace; that is, where should I apply it?

4—What is a good solution to run through the engine and radiator to cleanse them of a light rust sediment?

5—If aluminum alloy pistons were used in the Westcott referred to, what percent more power and speed would be gained, approximately?

6—Would putting washers under the valve springs of the above Westcott increase its speed and response? How thick should these washers be, and should I put washers under each valve spring or only under the intake or exhaust valves.—Ben E. Betts.

1—Packard obtains its brake lining from the Standard Woven Fabric Co., Walpole, Mass., Marmon uses Thermoid, and in the Pierce-Arrow the external brake lining is multibestos and the internal brake lining Thermoid. We have no information concerning this equipment on Resta's Peugeot.

2—A plain cast-iron ring. A working drawing is shown in Fig. 3.

- 3—To the top groove.
- 4—A solution of potash.
- 5—It is impossible to approximate.
- 6—The present valve springs were designed to exert the exact pressure required. We see no reason why this pressure should be increased unless the values tend to lag.

### WIRING DIAGRAMS OF 1915 CASE Car Runs 5 Miles, Stops, Then Starts After Standing

Forest City, Iowa.—Editor MOTOR AGE—Publish a diagram of the lighting and ignition system used on the 1915 Case car.

- 2—Give the bore and stroke of this car.
- 3—Can MOTOR AGE tell what is wrong with this car? It will run all right for about 5 mi.; then it will stop; and after it is left standing for a few minutes will start and run about 5 mi. again. This car will run about 6 or 7 mi. on a gallon of gasoline. The lights are in good condition, and the battery is fully charged, and it will not start at all.—L. Thompson.

The ignition in the model 35 was taken care of by a separate Bosch system. The wiring diagram of this system is shown in Fig. 5. The wiring diagram of the starting and lighting system is shown in Fig. 6.

- 2—The bore and stroke of the model 35 is  $4\frac{1}{4}$  by  $5\frac{1}{2}$ .

3—It sounds like a stopped up gasoline line, though your information is very meager. It might be that the line was clogged somewhere between the tank and carbureter so that an amount of gasoline too small to meet the demands of the engine would get through.

### WANTS INNER SLEEVE FOR FORD Suggests Economy Measure in Reducing Engine Bore

Milan, Minn.—Editor MOTOR AGE—In regard to reduced gear ratios, smaller cylinders, etc., permit me to express my views concerning the Ford car. As this car has a  $3\frac{3}{4}$  in. bore by 4 in. stroke, could not some concern supply those of us that might want it, with a sort of shrapnel affair—a cylinder having  $\frac{1}{4}$  in. walls fitting into the  $3\frac{3}{4}$  in. regular cylinder and reducing the bore to  $3\frac{1}{4}$  in.? With a Ford engine of  $3\frac{3}{4}$  in. bore by 4 in. stroke and aluminum pistons I believe the acme of economy including freedom from need of tightening up connecting rods would be provided. If the gear ratio would have to be reduced, a thing I do not think would be necessary, the suppliers of the inner cylinders and pistons would doubtless be willing to attend to this. Perhaps the flywheel could be reduced in circumference, especially if the ignition was replaced by a high-tension magneto. Passing this on I suggest that the next change in type will be to substitute for a strictly vertical engine, one having an inclination to lean to one side, or one with inverted crankcase and pumping oil out of the cylinders instead of splashing it in.—H. Skreberg.

It is a good suggestion. Although it is MOTOR AGE's opinion that the car would be underpowered for country driving it might find its field for city use or where the roads are unusually level. There is no doubt but that the car would be one of good economy. We do not understand

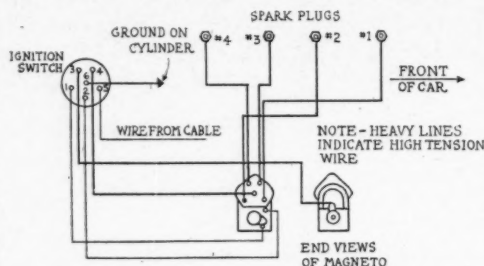


Fig. 5—Wiring diagram of Bosch ignition system used on Case, model 35

your suggestion regarding the inverted crankcase. Surely you do not mean using the cylinders for oil wells.

### READER DESIGNS HIS IDEAL CAR Has 135- to 140-in. Wheelbase, Disk Wheels, No Running Board

St. Louis, Mo.—Editor MOTOR AGE—The design shown in Fig. 8 is for a perfect motor car. The wheelbase ranges from 135 to 140 in., the tires are 35 by 5, or smaller, and are cord. The car is hung very low. The wheels are wire disk like the Rolls-Royce and the exhaust is placed on the side like the Biddle. The car has no running board.

The front seats are divided which permits one to enter the back seat. The gasoline is carried in the tail and tires carried on the side. Springs are semi-elliptic front and rear. The windshield is slanting to make a racy appearance. The rear cowl is so low it hardly is noticeable.

Other equipment is Boyce motometer, Hartford racing type shock absorbers, and a Continental or Duesenberg motor. —George Harrington.

### MOST POWERFUL STOCK MOTOR CAR Not Necessarily the Fastest—Hudson Has Stock Chassis Speed Record

New Orleans, La.—Editor MOTOR AGE—What is the most powerful stock touring car made?  
2—Is the most powerful car the fastest?  
3—About what speed is attained by the Pierce-Arrow 60?

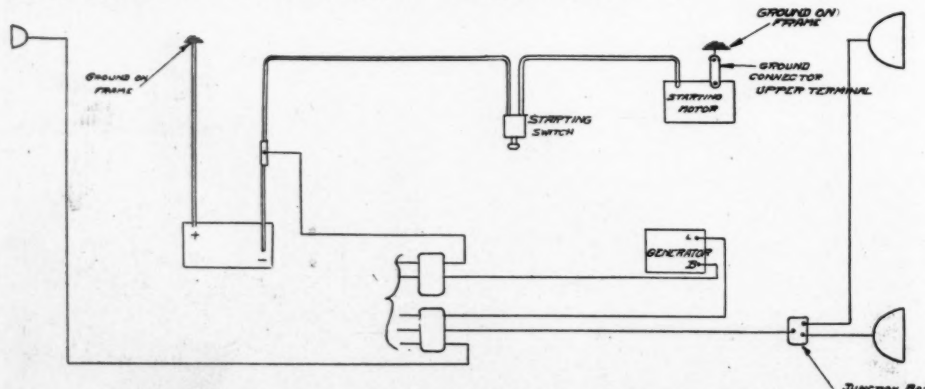


Fig. 6—Wiring diagram of starting and lighting system on 1915 Case

- 4—What is the value of the racing Peugeot cars as used by Aitken and Resta?—J. T. Swoop.

- 1—There have been no official tests. The Hudson has the stock chassis speed record.
- 2—Not necessarily.
- 3—No official records.
- 4—This cannot be published at this time.

### EFFECT OF WATER VAPOR IN GAS Supposed to Oxidize Carbon and Increase Explosion

Chandler, Colo.—Editor MOTOR AGE—Is there any device or scheme which introduces water, steam or vapor into the carbureter or intake manifold or which in any way will increase the moisture of the air that mixes with the gasoline or gasoline vapor going into the cylinders that will really remove carbon?

- 2—If there is such a contrivance, explain how the dampness will remove carbon.

- 3—If it does not remove carbon, will it prevent the formation of same in the cylinders, and how does it do it?

- 4—Explain how increasing the dampness of the air causes the engine to give more power and run more even. Most anyone will notice this on a rainy day or just after a rain. This seems true in this country, Colorado.

- 5—Do the numerous devices that are, or rather have been, sold more in the past for the taking in of air through a small hole in the manifold decrease carbon formation, and how do they do it, that is, from a chemical point of view?

- 6—Is there a way of decomposing water into hydrogen and oxygen other than by electrolysis, or use of chemicals?

- 7—Is hydrogen gas explosive without the presence of oxygen?

- 8—Is Oxy-hydrogen more explosive than just pure hydrogen? Which would give the more power for running an engine, hydrogen or oxy-hydrogen compared with gasoline? Does MOTOR AGE know of any tests that have been made?

- 9—Does MOTOR AGE know if Louis Enright or Mr. Morrison's claims for generating hydrogen gas by the decomposition of water by chemicals has been practicable? Whatever became of their process? If such was true that they had run an engine or an engine could be run by hydrogen or oxy-hydrogen, would a carbureter be necessary?—Reader.

- 1—There are now several devices on the market which inject water vapor into the manifold and thus combine it with the intake gas and from the volume of sales existing they surely must have merit.

- 2—The dampness is supposed to remove the carbon by oxidizing it. The theory is that the water is differentiated into oxygen and hydrogen, the former combining itself with carbon to form a gas which passes out of the muffler.

- 3—The device is supposed to keep carbon from the cylinders by the same chemical action.

- 4—It gives the gasoline vapor more burning force because of the greater amount of oxygen.

- 5—These are finding as large or a larger sale than heretofore. It hardly seems reasonable to suppose that they will prove a great aid in removing or keeping out carbon unless one considers that their function is to give a more perfect mixture, and that a more perfect mixture means more thorough burning of fuel and thus less free carbon. From a standpoint of fuel economy there is no doubt but what they are of value.

- 6—Not so that they may be retained. Water in an exploding cylinder is supposed to differentiate into its elements.

- 7—No.

- 8—Yes. MOTOR AGE knows of no tests that have been made.



9—These processes have never been developed to a standpoint of practicability as far as we know.

### TIRE DOUGH RADIATOR PLUGGER Reader Happens on Remedy He Says Is Best Yet

St. Paul, Minn.—Editor MOTOR AGE—It may interest some of the MOTOR AGE readers to know what will positively stop a bad radiator leak. Simply plug it from the outside with tire dough. This will stop leaks large enough to stick a lead pencil in. Last summer my fan came off and cut half a dozen holes in the radiator, one large enough to put my little finger in. Did not know what to do as I was out in the country, but as an experiment tried tire dough. It worked beyond my hopes, made a water-tight repair, and I did not have it soldered for 3 weeks, and when I did have it taken care of an old radiator man was amazed to know that any substance would stop a radiator in the condition mine was in.

If my little find will help out some motorist, am glad to pass it along. Might also add that should any reader have the misfortune to break a pump or magneto shaft when miles away from a town, a very satisfactory temporary repair can be made in a short time by finding a green sapling of about the proper size, remove the bark and with a jack knife cut and whittle to resemble broken shaft, retune the motor, and he will get along O.K. until he reaches a machine shop.—Maynard Norton.

### High Gears in Ford

Knoxville, Tenn.—Editor MOTOR AGE—What speed could be obtained with a Ford car fitted with 2½ to 1 gear ratio?

2—If the above car was equipped with Stromberg carbureter, Atwater-Kent ignition and Lynite aluminum pistons, would it make 65 miles an hour?

3—Which is the best carbureter for Ford cars, Stromberg, Rayfield or Miller?—Lucian Zates.

1—Jobs have been built up which have shown a speed better than 75 m.p.h.

2—Yes, if the fittings are properly made.

3—MOTOR AGE cannot offer preference.

### Speedometer on Old Chalmers

Washta, Ia.—Editor MOTOR AGE—Kindly give suggestions for installing a speedometer on a 1913 Chalmers model M torpedo roadster.—Clifford Law.

The speedometer may be installed under the cowl or, perhaps, preferably upon the steering column. Tell the speedometer

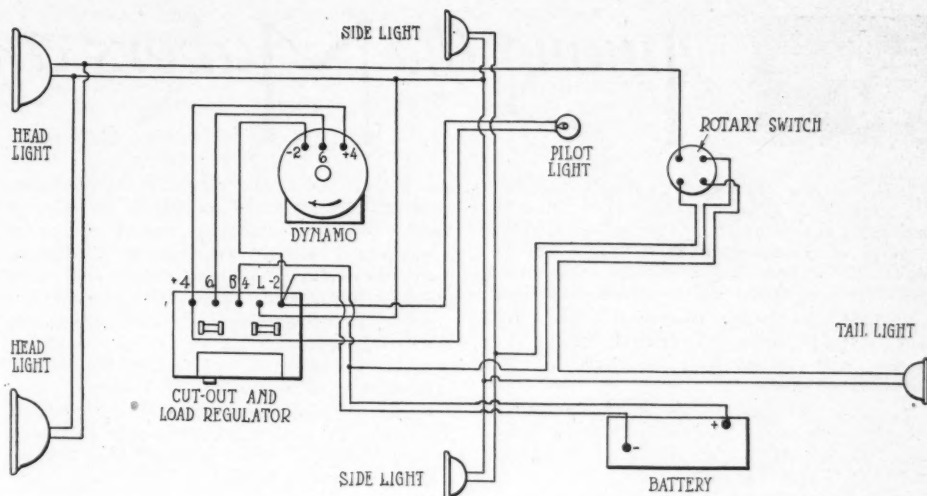


Fig. 7—Standard Apeldo wiring for 1912 systems

maker or station you want it for 36 by 4 or 36 by 4½ tires, depending on which you are using.

### Battery for Lighting Ford

Wayne, Kan.—Editor MOTOR AGE—Would it be advisable to use storage batteries on a Ford car to run the head, tail and dash lights where there is no generator to keep charging them?

2—What size battery would be most successful for this work?

3—Give an estimate as to the number of hours it would run lights with one charging.

4—Would Motor AGE advise any certain make of battery for this work?—G. R. Teagarden.

1—This method of lighting Fords has considerable popularity.

2—An 80 amp.-hr. battery should handle the work.

3—Approximately 80 hr.

4—Any standard make. Several manufacturers have batteries especially suitable for just this kind of work.

### Saxon Speeded Up

Ashtabula, O.—Editor MOTOR AGE—Would I gain more power by putting in Aluminite pistons and non-leaking piston rings in my 1915 Saxon four roadster? If any, how much?

2—Would a Rayfield 1¼ in. carbureter be too large for the motor? I have a chance to get a new one at a very reasonable price.

3—If I would have the new pistons ¼ in. longer to raise compression, would I notice any difference?

4—By making the above changes, how fast could my car run?—M. S. Sargent.

1—You would gain more power if the pistons and rings were properly fitted. So much hinges on the way the installation is made that even an approximate figure of the increase cannot be given.

2—We would suggest asking the Rayfield makers. MOTOR AGE cannot decide

upon carbureter sizes because of the diversity of kinds.

3—Slightly more power possibly. However, assuming you have the proper compression now, the change will not help any.

4—There is no means of estimating. Experimenting is the only test.

### WIRING FOR OLD MODEL NORWALK Wants to Use Piston with Skirt ⅜-In. Longer

Zearing, Iowa—Editor MOTOR AGE—Give a wiring diagram of the Apeldo lighting system used on the 1912 Norwalk overhead-valve six, which has no starter. Kindly show where to hook up the dash voltmeter and cutout.

2—Could pistons ⅜ in. longer than those with which the engine was originally fitted be used in a Northway 4 by 4 in.? The pistons are ⅜ in. longer from wrist pin center to head, and ⅜ in. longer from the wrist pin center to the bottom of the skirt.—W. Blissell.

1—The standard Apeldo wiring for 1912 systems is shown in Fig. 7. This should apply to the Norwalk car. The connections you ask for are shown in the diagram.

2—It depends entirely on the construction of the engine. If the engine is disassembled you can set one of the pistons at the bottom of its stroke and ascertain whether the bottom of the piston skirt comes to the bottom of the cylinder. Then set the connecting rod at the point where the arm of the rod is nearest the piston and ascertain whether the clearance is great enough to permit ⅜ in. more in the length of the skirt. There is no need of increasing the skirt length of the pistons so that it would project below the cylinder when on lower dead center.

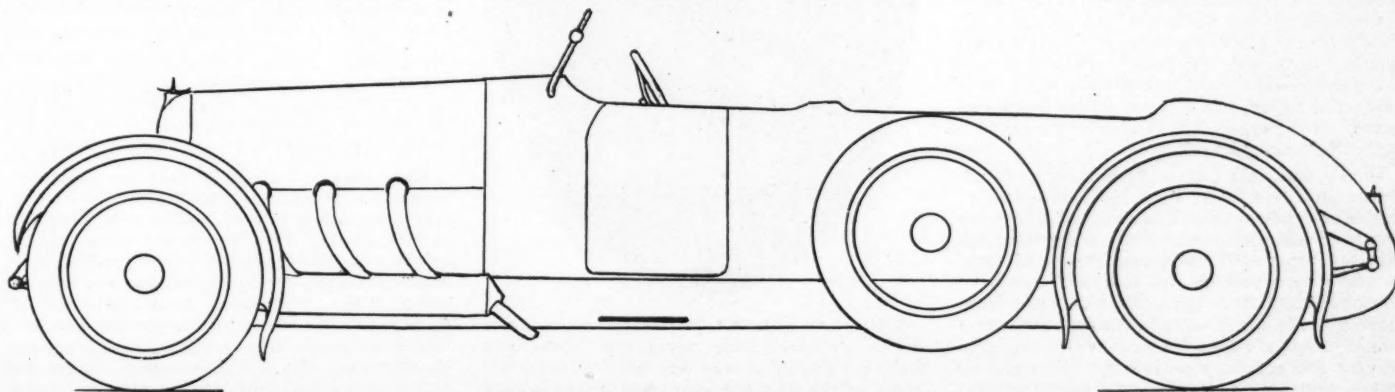


Fig. 8—Design of ideal car, made by reader



# Among the Makers and Dealers



**FIELD Motor Increases Capital**—The Field Motor Co., Grand Rapids, Mich., has increased its capital from \$100,000 to \$500,000.

**Innes With Chevrolet**—H. L. Innes, who resigned from Dodge Bros. recently, has joined the Chevrolet Motor Co. as factory manager.

**Niehoff with Dodge Brothers**—E. W. Niehoff, formerly with Waterhouse-Sands Co., is now with Dodge Bros. in charge of the commercial sales.

**To G. M. Truck Co.**—W. B. Cochrane has joined the forces of the General Motors Truck Co., Pontiac, Mich., and will be in charge of Pacific coast business.

**Manages Middle West Sales**—R. O. Monroe has been made manager of the middle west sales for the Monroe Motor Co., Pontiac, Mich., and will have offices at South Bend, Ind.

**Allen Joins Republic**—Gould Allen, formerly sales manager of the Colbert Gear Co., Lockport, N. Y., has joined the sales staff of the Republic Motor Truck Co., Alma, Mich., and will be located on the Pacific coast.

**Columbia to Increase Capital**—The Columbia Motor Truck & Trailer Co., Pontiac, Mich., will increase its capital from \$35,000 to \$100,000. The officers are: President, G. F. Clark; vice-president, Frank Carroll; secretary, Leigh Lynch.

**Capital Increased \$50,000**—Over-subscription of the stock of the Saginaw Malleable Iron Co. brought an increase in capitalization from \$350,000 to \$400,000. The company now has a capitalization of \$250,000 common stock and \$150,000 preferred stock.

**Building a New Town**—The Electric & Auto Parts Co., the Morgan & Wright Tire, Rim & Wheel Co. and the Economy Metal Stamping Co. have joined with several other manufacturers in the erection of a suburban community near Cleveland, Ohio, where each will construct factories.

**Nice Company to Build**—The Nice Ball Bearing Co., Philadelphia, Pa., has purchased ground on which it plans to build a new factory. The company was incorporated less than a year ago by Budd C. Nice and Frank Beemer and has since succeeded the Pressed Steel Mfg. Co., also maker of ball bearings.

**To Manage Fisk Branches**—W. H. Barcus has been made manager of the new Cleveland district of the Fisk Rubber Co., which embraces the company's branches at Cleveland, Toledo, Lima, Columbus, Youngstown, Dayton, Cincinnati and Pittsburgh. Mr. Barcus has been in charge of the Fisk branch in Cleveland for several years.

**Market Value Tax Upheld**—The White Co., Cleveland, Ohio, which objected against the increase of its valuation from \$3,167,000 to \$14,000,000 for tax purposes, lost its case before the new tax commission. The tax commission declared it a proper method to use the market value of a corporation stock as a basis for fixing value on which it shall pay taxes. It is reported that the White Co. will carry its case into court.

**Heavy Business Defers Pleasure**—Although a banquet had been provided, employees of the Auto Body Co., Lansing, Mich., were forced to abandon temporarily a get-together meeting by press of business at the factory. In some departments the company has been running night and day, 300 men being employed on the night shift in the machine shop alone. Nearly 1400 men now are in the employ of the company where but 850 were on the payroll only a few months ago. Several new dry kilns have been added to the facili-

ties of the plant, and recently the company ordered 3,000,000 ft. of lumber to be used in body building.

**Resigns from Anti-Friction**—S. A. Strickland has resigned as mechanical and sales manager of the Anti-Friction Co., Detroit.

**Olympian Increases Capital**—The Olympian Motor Co., Pontiac, Mich., has increased its capital from \$1,000,000 to \$2,000,000 for general expansion purposes.

**Packard Truck Sales Large**—The Packard Motor Car Co. sold \$2,262,500 worth of trucks during January, this making the largest month the company has had for truck business.

**Stoll Is Promoted**—O. E. Stoll, who has been in Philadelphia for three years as manager of the General Motor Truck Co.'s branch, has been appointed sales manager of the company. He succeeds W. K. Chillkoot.

**Parker Reaches Yokohama**—Walter E. Parker, president of the Commerce Motor Car Co., has arrived at Yokohama, Japan, en route to Singapore, according to a cable received by the company at Detroit. Mr. Parker is on a business trip.

**Hayes Redeeming Bonds**—The Hayes Mfg. Co. on April 1, 1917, will redeem the bonds given under a mortgage bearing date of April 1, 1913, at their par value with accrued interest and a premium at the rate of 3 per cent of the par value of each bond.

**T. S. Gamble Resigns**—T. S. Gamble, assistant sales manager of the Maxwell Motor Sales Corp., has resigned to become a partner in the firm of Benson, Campbell & Slaten, advertising agents, with offices in Chicago and Cleveland. Mr. Gamble will make his headquarters at the Cleveland office and handle the eastern business of his firm. He has had extensive experience in retail

advertising and was for five years with the advertising department of the White Co. He formerly had charge of Maxwell advertising.

**Body Plant at Grand Rapids**—The Ionia Auto Body Co. has purchased one of the plants of the Heinz Pickle Co. at Grand Rapids, Mich., for \$85,000.

**Ford Plans British Additions**—Henry Ford plans to spend \$10,000,000 on his factories in England. The money will be spent on enlargements and additions to the present plants.

**New Carburetor Co. to Build**—The Western Carburetor Co., Alma, Mich., recently incorporated for \$120,000, has let contracts for a factory. Machinery will be installed within 60 days.

**To Distribute Stewart Trucks**—W. E. Kenyon, formerly sales manager of the Chicago Republic Motor Truck Co., has resigned and will distribute Stewart motor trucks in Illinois, Wisconsin, Indiana and part of Michigan.

**To Manage New Device Company**—C. F. Loomis, Peoria, Ill., formerly with the Peoria Tractor Co., has been appointed manager of the newly organized Economy Device Co., which will manufacture and sell kerosene attachments for Ford cars.

**Sues When Wheel Breaks**—Dr. G. A. Trueman has filed suit against the Ford Motor Co. and the Prudden Wheel Co. for \$100,000. Doctor Trueman had an accident which he claims lost him \$100,000 in earnings and states that the accident resulted when the front wheel of his Ford car broke down.

**Joins Nash Company**—W. K. Chilcott has resigned as sales manager of the General Motors Truck Co. to accept a position with the Nash Motor Co. of Kenosha, Wis. Mr. Chilcott will have charge of the sales in the northwest division.

**Four Wheel Declares Dividends**—At a stockholders meeting the Four Wheel Drive Automobile Co., Clintonville, Wis., has declared a 100 per cent stock dividend and increased the capital from \$500,000 to \$1,000,000. A cash dividend of 15 per cent was declared, making a total of 30 per cent paid in 1916.

**Opens Cleveland Branch**—The Richardson-Phenix Co., Milwaukee, Wis., manufacturer of lubricating devices, has opened a sales office at Cleveland, Ohio, in charge of W. J. Oettinger. The office will handle the engineering details of problems connected with the lubrication of machinery and the installation of systems for circulating, filtering and sterilizing cutting oils and compounds.

**Parts Makers Add**—Fuller & Sons Mfg. Co., Kalamazoo, Mich., maker of parts, has awarded a contract for the erection of an addition to its plant. The structure will have four stories and basement. Building and machinery will cost \$150,000 and will double the capacity of the present plant. The company recently increased its capital to \$100,000.

**More Happy Farmer Tractors**—To make possible a production of 2800 Happy Farmer tractors during the calendar year, the La Crosse Tractor Co., the recent consolidation of the Sta-Rite Engine Co., La Crosse, Wis., and the Happy Farmer Tractor Co., Minneapolis, Minn., has leased the old plant of the Summit Stove Works at LaCrosse and will use it to handle the overflow from the main plant in that city. The company started out to manufacture about 1500 tractors this year, but up to Feb. 1 had booked guaranteed or-



**SHOWING ITS COLORS**—The colors of the Autocraft spark plug being red, white and blue, the young woman who distributed literature at the Chicago show had a flag draped about her.



ders for 2800 machines, which now has been determined as the maximum production to be undertaken.

**Hancock Mfg. Co. Gives Bonus**—The Hancock Mfg. Co., Charlotte, Mich., has awarded forty-two of its employees bonuses aggregating \$8,000.

**Gotchell With Smith**—Nelson Gotchell, formerly with the Chandler company, is now sales manager of the northwest for the Smith Motor Truck Corp.

**Dawson Again Branch Manager**—C. Earl Dawson, who has been the wholesale supervisor for the Chevrolet Motor Co. at Flint, Mich., is again in Detroit in the position he formerly held of factory branch manager for that company.

**Buys Battery Branch**—J. J. Thomson, Grand Rapids, Mich., and I. Guiffre, Traverse City, Mich., have formed a partnership and purchased the Traverse City branch of the Sales Storage Battery Co. Mr. Thomson will manage the business.

**Williams With Klaxon**—H. R. Williams has been appointed sales engineer and manager of the Detroit office of the Klaxon Co. and will have charge of the factory equipment business. Mr. Williams was formerly with the Chanslor & Lyon Co. of Los Angeles, Cal.

**McFarland-Westmont Changes**—The McFarland-Westmont Tractor Co., formerly of Lodi, Wis., began the manufacture of all-steel tractors in its permanent works at Sauk City, Wis., on Feb. 15. The company occupies the plant erected for the Shaw Motor Co., Chicago, but never used.

**Mitchell Net Earnings**—The Mitchell Motors Co., Racine, Wis., has issued its first annual report for the year ended Oct. 31, 1916, showing net earnings, after interest, taxes and organization expenses, of \$1,188,397. This is equal to \$9.73 a share on the 125,000 shares of stock outstanding, of no par value.

**Sales Agents for Hayes**—F. E. Castle and H. W. Kyte have completed a transaction with the Hayes Wheel Co., Jackson, Mich., to become general sales agents for its wire wheels. Mr. Kyte was formerly manager of the Houk Mfg. Co., and Mr. Castle has been in the accessory business for the last 16 years.

**Limousine Top Co. Expands**—The Limousine Top Co., Kalamazoo, Mich., has increased its capital from \$30,000 to \$100,000. An additional 7500 sq. ft. of floor space will be provided in a new building now under construction, while 60,000 ft. has been leased. This triples the capacity of the concern and will enable the employment of 250 workers.

**To Handle Detroit Office**—H. T. Ames of the general sales department of the Sexton Oil Co., Chicago, will take charge of the office which is to be opened at Detroit. The Sexton Company has increased its output from 20,000 gallons a week in 1916 to 600,000 gallons a week at the present time and has opened more than twenty factory branches.

**Monroe Is In Merger**—The Port Huron Construction Co., Port Huron, and the Monroe Motor Car Co., Pontiac, Mich., have merged. The officers of the new organization are: President, R. F. Monroe; vice-president, S. G. Jenks; secretary-treasurer, S. W. McFarland. S. G. Jenks is in charge of the mechanical end of the concern. Plans are being made for an output of 7000 this year.

**Continental Property Transferred**—All Muskegon property of the Continental Motors Co. at Muskegon, Mich., has been transferred to the Continental Motors Corp., the new company formed to care for the increase in capitalization of the Continental. Two deeds have been filed. One turns the property over from the Continental Motors Co. to the Peninsular Motors Co., a nominal concern formed by attorneys representing the Continental, and the other deed turns the property

over from the Peninsular Motors Co. to the Continental Motors Corp.

**Spring Co. Increases Capital**—The Perfection Coil Spring Co., Jackson, Mich., has increased its capital from \$20,000 to \$100,000.

**Paige Buys Land**—The Paige-Detroit Motor Car Co., Detroit, has purchased 33 acres of land adjacent to the site of the Saxon Motor Car Co.'s new plant.

**Chalmers Territory Contracted**—The Taylor Motor Co., Salt Lake City, Utah, and the Trist Automobile Co., Pocatello, Idaho, have closed a deal with the Chalmers Motor Car Co. for the intermountain territory including Utah, part of Wyoming and Nevada and Idaho.

**Allen Manages Kenosha Factory**—C. E. Allen, who has been the superintendent of the C. M. Hall Lamp Co. in Detroit, will manage the factory at Kenosha, Wis., which the company now operates since its purchase from the Badger Brass Mfg. Co.

**Maxwell Buys Ohio Factory**—The Maxwell Motor Co., Inc., has purchased the plant of the Manufacturers' Production Co. at Dayton, Ohio, and will use it for the manufacture of inclosed bodies. This addition makes three plants in Dayton for the Maxwell Co.

**Body Company Organized**—The Porter Body Co., Ypsilanti, Mich., has been organized with \$30,000 capital to manufacture parts. It succeeds the Globe Truck Co. in business. The officers include David Killins, president; G. E. Roiter, vice-president; G. Killins, treasurer, and B. Killins, secretary.

**Federal Increases Capital**—The Federal Motor Truck Co., Detroit, has increased its capital from \$500,000 to \$2,000,000. The increase entails distribution of a stock dividend of 100 per cent through transfer of \$500,000 surplus to the capital account. All officers and directors of the company were re-elected.

**Motor Products Plans Issue**—The Motor Products Corp., Detroit, plans to issue \$1,000,000 in notes maturing serially every 6 months over a period of five years to fund the purchase of the plant formerly occupied by the Lozier Motor Co. The plant was bought last year. In the 8 months ended in December the volume of business transacted

by the corporation amounted to \$4,072,043. The books now show unfilled orders amounting to \$6,000,000.

**Frank Blanchard Dies**—Frank Blanchard, assistant sales manager of Firestone Rubber Co., Akron, Ohio, died Feb. 12 after an operation.

**Boone Tire Branch Planned**—The Boone Tire Co., Sycamore, Ill., will establish a branch plant with a capacity of 200 tires and tubes daily at Chippewa Falls, Wis.

**Carroll Goodrich District Manager**—F. R. Carroll has been appointed district manager at Los Angeles, Cal., for the B. F. Goodrich Co. Mr. Carroll has been in charge of the branch there.

**Perpetual to Add**—The Perpetual Spark Plug Co., Scranton, Pa., will build a new factory in Dunmore. By the addition of new machinery the production will be increased from 1500 to 30,000 spark plugs a day.

**Michigan Copper Elects**—The Michigan Copper & Brass Co. has elected the following officers: D. M. Ireland, president; J. J. Whitehead, first vice-president; H. H. Smith, second vice-president; A. L. Simmons, secretary; John S. Connell, treasurer.

**Firm Changes Name**—The Samuel Cupples Woodenware Co., St. Louis, Mo., has dropped the word "Woodenware" from the firm name, as the company has entered into the manufacture of tires and tubes. The concern makes Cupples casings and Rhinos inner tubes in its St. Louis factory.

**Production by Summer Maybe**—The Ghent Motor Car Co., recently organized, is preparing to open a factory at Ottawa, Ill. J. E. Grey has been appointed factory superintendent and is now engaged in remodeling the building. It is hoped to commence the manufacture of motor cars early in the summer.

**Briggs & Stratton Build**—The Briggs & Stratton Co., Milwaukee, Wis., maker of ignition systems, electrical specialties, etc., has increased its capital stock from \$50,000 to \$250,000. The company is building a new plant costing \$100,000, which is to be ready for occupancy about April 1. Stephen S. Briggs is general manager.

**Ball to Engineering School**—John D. Ball, Schenectady, N. Y., late of the consulting engineering department of the General Electric Co., has accepted the appointment of professor of electrical engineering in the Milwaukee School of Engineering. Mr. Ball is a graduate of the University of Illinois and a member of the American Institute of Electrical Engineers.

**Studebaker Makes Changes**—W. C. Lacy, assistant branch manager for Studebaker at Dallas, Tex., has been appointed district manager at El Paso. Iver Schmidt, assistant branch manager in St. Louis, has been made assistant branch manager at Dallas. Edward McCarthy, formerly vehicle manager at Dallas, has been appointed assistant branch manager at Portland, Ore.

**Takes Over Page Plants**—The All-Season Body Co., incorporated for \$500,000, will take over plants of Page Bros. Buggy Co., Marshall, Mich., to manufacture motor car bodies. The officers are: W. L. Page, president; J. A. McAvoy, vice-president; E. E. Page, secretary; W. J. Dibble, treasurer. The Briscoe Motor Corp. has signed a contract for 5000 bodies with the new company.

**Rubber Men Bank Officers**—F. A. Seibeling, president of the Goodyear Tire & Rubber Co., Akron, Ohio, has been elected president of the new Ohio Savings & Trust Co. The company has just been organized by East Akron factory men. C. W. McLaughlin, vice-president of the Mohawk Rubber Co., was elected vice-president; W. E. Palmer, assistant treasurer of the Goodyear Co., treasurer, and C. F. Ayers, secretary.



**FOUNTAIN OF YOUTH**—The Sexton Oil Co. constructed a "fountain of youth" for its exhibit at Chicago. Oil flowed over the fountain, and a girl lent further youth.

# From the Four Winds

**CENTRAL Illinois Trail Organizes**—The Peoria, Pekin and Bloomington trail has been organized with John Cook of Tremont as president. This route extends through Central Illinois and connects various north and south trails. The trail will be marked by a white band on the telephone poles, with the letters "P. P. B."

**To Mark County Roads**—Ottawa County, Michigan, has taken steps to mark its principal roads. The board of county road commissioners has decided to purchase twenty-four sign posts, which will be placed at the principal crossings. The sign posts are to be constructed of steel angles and will be rustproof with black letters on a white background.

**Michigan to Have Another Route**—Present prospects are that there will be a fine state road from Big Rapids to Cadillac, Mich., in 1917. Several bond issues have been voted on favorably by the townships along the route. The proposed road is the result of activity by the Mackinac Trail Association, of which L. F. Bertrau of Big Rapids is president.

**Los Angeles Displays Flag**—In the effort to stimulate patriotism following the breach in diplomatic relations between the United States and Germany, motorists at Los Angeles, Cal., were called on to display the national emblem on their cars. The response was more or less general. It did not seem to make any difference with some motorists whether the flag was placed properly or inverted; its presence was all that concerned them. It was not an uncommon sight to see a 5-ton truck at work in an excavation far below street level with the flag gaily floating from a stick attached to the radiator intake.

**Asks Owners to Aid**—The Champaign County, Illinois, Highway Improvement Association sent out 4000 postcards, asking co-operation in the campaign for the improvement of the highways. Each owner is asked to send a dollar to help pay the expenses of the movement to provide a bond issue for the system of hard roads which has been outlined. In the past the Champaign Chamber of Commerce has paid all expenses in the good roads propaganda, and it was thought only fair that the car owners, who receive the greatest amount of benefit, should help to put over the good roads bond issue.

**New Route is Planned**—Although advocates of a bee line route for the Jackson highway through Alabama were defeated in the recent contest for the routing of this national road, they are planning to establish a route along this line, anyway. It is to be known as the North and South National highway. It first was planned to call the route the Lakes to Gulf highway, but the name chosen is believed to explain its advantages more fully. The highway will run from Chicago to New Orleans. It will follow the usual way from Indianapolis to Louisville and Nashville, but there it will diverge and will proceed in an almost due south line to Columbia, Tenn., Athens, Decatur and Birmingham. It will then pass through Montgomery, Selma and Mobile, Ala., and along the gulf to New Orleans. F. J. Crampton, Montgomery, Ala., is president of the association. L. N. Buell, of Cullman, is secretary. Headquarters will be at Montgomery.

**Meridian Marked to Corinth**—The Meridian highway is now marked as far south as Corinth, Miss. The latter city is the gateway to Shiloh National Park. The road from Corinth to Artesia, Miss., 150 miles,

has been improved by macadam treatment and is in good condition for southern tourists.

**Memphis Bridge Ready Soon**—A large part of Arkansas will be made accessible to traffic by the completion within the next few months of the viaduct and wagonway of the Harahan bridge. This will provide a link between Memphis, Tenn., and Eastern Arkansas. The viaduct alone will cost \$150,000, and preparations are being made to expend \$125,000 in improving roads in the vicinity of the bridge, so that full advantage can be made of the connection. Farmers in a large section will be enabled to use motor trucks to bring their crops to Memphis. Large sums will be saved annually in the marketing of cotton.

**Los Angeles Fines Decrease**—Four years ago fines collected in Los Angeles county for violation of the speed laws amounted to \$26,000. Now they have fallen off to such an extent not enough is collected to pay the

expense of the motorcycle patrol. The number of motor vehicles in use has more than tripled in that time, and the board of supervisors has started an investigation to learn the cause of the discrepancy.

**Ask Official's Road Co-operation**—A delegation from six counties in Pennsylvania numbering almost 200 persons visited the state highway commissioner to secure his and Governor Brumbaugh's co-operation in establishing a highway between Erie and Pittsburgh. The governor expressed his entire sympathy with the plan to secure through trunk-line routes on the highway system of the state.

**Milwaukee to Help Wausau**—The Wausau Automobile Dealers' Association, Wausau, Wis., selected the dates of Feb. 21-24 for its first annual show, which is being held in the grand opera house. In the conduct of this show the association is assisted by the Milwaukee Automobile Dealers, Inc., which has loaned the services of Bart J. Ruddle, who has managed the Milwaukee shows. A false floor was constructed so that the entire main floor of the theater is on a level with the stage.

**Bridge Clears Way to Florida**—The last big obstacle to motor traffic into Florida was removed with the opening of the bridge across the St. Mary's river at Folkstone, Ga., which was celebrated by a gathering of several thousand good roads enthusiasts on Feb. 7. This bridge is on the Dixie highway and will be used by hundreds of thousands annually. It is on the road from Waycross to Jacksonville, which at times has been impassable because of the swamps through which it runs.

**Birmingham to Show**—A state-wide advertising campaign has been started by Birmingham, Ala., dealers in an effort to obtain a record-beating attendance at the show to be held there during the week of March 5, when Fashion Week will also be held by local merchants. A large building is being erected on the lot on which Birmingham's new post-office is to be located, and the temporary nature of the structure is to be hidden by an abundance of decorative effects. H. B. Marks has been chosen as manager and Ted Brownell, Hubert Drennen, Bradley J. Saunders and Henry M. Bailey have been made the arrangements committee.

**Would Tighten Theft Legislation**—The International Motor Clubs, with headquarters in Philadelphia, is preparing a bill to be submitted to the Pennsylvania state legislature providing for greater penalties for motor car thefts. The bill would fix the fine at \$1,000 and would make it mandatory for all purchasers of second-hand cars to file a complete description with some state bureau. The certificate of character issued to members of the club to show to police authorities in various towns that they are responsible persons has received the endorsement of the mayors of Reading, Pa., and Atlantic City, N. J.

**Corn Belt Route Organizes**—The Illinois Corn Belt Route, which extends from Burlington, Iowa, across Central Illinois to Effner, Ind., has been organized. This will be a short line to form a connection with the Dixie highway at Watseka, Ill., and to connect with various north and south trails at Peoria, Bloomington and Effner. The route will be marked by an 18-in. band of white around the telephone poles, with a 10-in. ear of corn stamped vertically. The association will affiliate with the National Highway Association and the Illinois State Highway Improvement Association.

## Coming Motor Events

### RACES —1917—

- May 19—Metropolitan Trophy, New York speedway.
- †May 30—Indianapolis speedway.
- †June 9—Chicago speedway.
- June 23—Cincinnati speedway.
- †July 4—Omaha speedway.
- †July 14—Des Moines speedway.
- †July 28—Tacoma speedway.
- August 4—Kansas City speedway.
- †September 3—Cincinnati speedway.
- †September 15—Providence speedway.
- †September 29—New York speedway.
- October 6—Kansas City speedway.
- October 13—Chicago speedway.
- October 27—New York speedway.

### †A. A. championship events for 1917.

#### SHOWS

- Feb. 19-24—Bridgeport, Conn.
- Feb. 19-24—Des Moines, Iowa.
- Feb. 19-24—Duluth, Minn.
- Feb. 19-24—Grand Rapids, Mich.
- Feb. 19-24—St. Louis.
- Feb. 19-24—Syracuse.
- Feb. 20-24—Salt Lake City, Utah.
- Feb. 21-23—Dodge City, Kan.
- Feb. 21-23—Springfield, Mo.
- Feb. 21-24—Bloomington, Ill.
- Feb. 21-24—Flint, Mich.
- Feb. 21-24—Wausau, Wis.
- Feb. 24-March 3—Newark, N. J.
- Feb. 24-March 4—Atlanta, Ga.
- Feb. 24-March 6—Brooklyn, N. Y.
- Feb. 26-March 3—Omaha, Neb.
- Feb. 26-March 3—Great Falls, Mont.
- Feb. 26-March 3—Utica, N. Y.
- Feb. 26-March 3—Charleston, S. C.
- Feb. 26-March 3—Wilkes-Barre, Pa.
- Feb. 26-March 3—Utica, N. Y.
- Feb. 28-March 3—La Fayette, Ind.
- March 1-3—Urbana, Ill.
- March 3-5—Green Bay, Wis.
- March 3-10—Boston.
- March 3-10—Washington, D. C.
- March 5-10—Bridgeport, Conn.
- March 5-10—Parsons, Kan.
- March 5-10—Jamestown, N. Y.
- March 5-12—Birmingham, Ala.
- March 6-10—Fort Dodge, Iowa.
- March 7-10—St. Joseph, Mo.
- March 12-14—Fort Worth, Tex.
- March 13-16—Vancouver, B. C.
- March 13-16— Fargo, N. D.
- March 14-17—Davenport, Iowa.
- March 14-17—Kenosha, Wis.
- March 14-17—Mason City, Iowa.
- March 17-24—Pittsburgh, Pa.
- March 19-24—Paterson, N. J.
- March 19-24—Cedar Rapids, Iowa.
- March 21-24—Trenton, N. J.
- March 27-31—Clinton, Iowa.
- March 27-31—Deadwood, S. D.
- April 4-7—Stockton, Cal.